THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

VOLUME XCII., No. 16. Whole No. 1,819. | NEW YORK, MONDAY, APRIL 18, 1910. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. H. WADELTON, Manager
THOMAS J. CUNNINGHAM and ELBERT P. CALLENDER, Editors.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

CONTENTS.

An Asterisk (*) Denotes an Illustrated Article.

OFFICIAL NOTICE—
Sixth Annual Convention, Southwestern Electrical and Gas Association. 721

EDITORIALS—
Second Annual Meeting, Pennsylvania Gas Association—Special Editorial Correspondence 721
Briefly Told 722
Current Mention.

BUREAU OF INFORMATION, THE AMERICAN GAS INSTITUTE 722
Questions Nos. 65 and 66, and Answers Thereto.

Method for Keeping Accounts of Small Gas Concerns, by Mr. F. Lincoln Hutchins 723

Fortieth Annual Meeting, New England Association of Gas Engineers—Continued from page 682. 725
First Day, Afternoon Session—A Try at the Question Box—Roll Call—A Word from the Man from Gloucester—Second Day, Morning Session—Maintenance and Selling Methods of Gas Lamps, by Mr. A. R. Burr, New Haven, Conn.—Discussion—*Management of Water Gas Generators, by Dr. Jno. F. Wing—Discussion.

Report of Proceedings, Fourth Annual Meeting, American Gas Institute—Continued from page 685. 732
Discusion on the Cohn Paper—Afternoon Session—*Automatic Oiling Meters, by Mr. Thos. D. Miller—Discussion.

*Dell's Improved Dip Regulator and Tar Seal. 736

ITEMS OF INTEREST FROM VARIOUS LOCALITIES 737
An Error—Annual Meeting, Louisville, Ky.—Gas Works Proposed for Homing, Okla.—May Increase Its Capital Stock, Springfield, Mass.—Reorganization at Peak's Island, Me.—Gas Works for Seaford, Del.—Contract for the Cruse-Kemper Company—Annual Meeting, Graves Supply Company—The Atlantic Highlands (N. J.) Gas Company—Change in Selling Schedules, Haverhill, Mass.—An Equitable Decision—Labor's Reward—Annual Meeting, American Gas Company—Betterments at East St. Louis and Belleville, Ills.—Proposed Gas Works for Houston Heights, Tex.—The Minneapolis (Minn.) Gas Rate—And Other Items.

Recent Patent Issues 738

The Market for Gas Securities 739

Public Lighting Tables for April, 1910 750

[OFFICIAL NOTICE.]

Southwestern Electrical and Gas Association.

SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION,
OFFICE OF SECRETARY,
DALLAS, TEX., Feb. 28, 1910.

The 6th annual convention of the Southwestern Electrical and Gas Association will be held in Beaumont, Tex., on May 12, 13 and 14, 1910.

D. G. FISHER, Asst. Secretary.

[Special Editorial Correspondence.]

SECOND ANNUAL MEETING, PENNSYLVANIA GAS ASSOCIATION.

HEPTASOPH HOUSE, EASTON, PA., April 13, 1910.

Dear JOURNAL: The great Keystone State is noted for its "hives of industry," both above the ground and under it; and of such is busy Easton, either way you take it. Hills and hollows it has, arranged by nature so that, were it not a modern commercial mart, it would still be marked for its rugged natural beauty. However, remembering that "Handsome is as handsome does," it is my bounden duty to here say, right at the close of the first day's sessions of the Pennsylvania Gas Association, that Easton received us well and is treating us royally. The arrangement of headquarters and meeting house—the first in The Karldon, the second in Heptasoph Hall—was excellent, in that both virtually adjoin. The weather was of the very finest type that Pennsylvania can show at any season, and the Committee of Arrangements, headed by that never-tiring gentleman whose name recalls one of the very high points in the Keystone State (Mr. B. F. Cresson), were hosts in name and deed. The opening session was convened at 10 A.M. to-day by President Holzer, whose announcement that the Secretary's desk would be occupied by Mr. W. O. Lamson, plainly brought out the lamentable fact that Secretary Merritt had not yet recovered from the illness which sore beset him some time ago. The call to order revealed the presence of quite on to 60 delegates, who were welcomed to Easton in neat phrase by its Mayor, the Honorable Mr. McKeen. A well worded acknowledgment of his Honor's courtesy was spoken by Mr. Cresson, after which came the disposing of several routine matters, such as outlining the nature of the entertainment and the method of procedure therewith, some letters of regret over the inability of the senders to be present (prominent in these was one from Mr. Henry L. Doherty), etc. It was ordered that a message of fraternal sympathy over his illness and expression of the hearty hope that he would soon be amongst them, busy as of yore, be forwarded him, conveyed or enveloped in a suitable floral token. The Report of the Council was noteworthy in that it recommended for membership the names of 16 in the Active and 10 in the Associate Class. The balance of the report, as well as the reports of the Secretary and Treasurer, amply showed that every business office to the Secretary of the Association was progressing satisfactorily. The report of the special committee, to whom had been committed the task of investigating the question as to the advisability of increasing the scope of the Association, reported in favor of admitting to membership properly qualified residents of the contiguous States of New York, New Jersey, Ohio and Delaware, and the recommendation was eventually adopted, although there was quite an undercurrent of thought to the effect that enough would have been done in this respect were the additions confined to New Jersey and Delaware. President Holzer's address was presented after the routine business had been closed up, and its thoughtful lines surely showed that a plenty of both time and thought had been given to its preparation. In it he especially reverted to the good which had been accomplished by those companies which had seen to it that their employees (particularly the younger ones) were afforded the means of becoming better acquainted, through the formation and the keeping of clubs, the maintaining of reading rooms, the giving of lectures, the holding of social receptions, and the like. It was a good, commonsense document, that appealed in its every paragraph to awaken thought in everyone who heard it. The first paper read was that by Mr. B. F. Cresson, whose theme was "Qualifications for the Successful Manager of a Public Service Corporation." Mr. Cresson certainly set a pretty high standard, that perhaps will be more easily attainable later on than now. The paper brought forth a brisk discussion. The Nominating Committee at this point handed in recommendations for office bearers for the following twelvemonth. The names proposed were:

LIBRARY OF CONGRESS APR 18 1910 SMITHSONIAN DEPOSIT.

For President—J. H. Keppelman, Reading.
For First Vice-President—C. W. Butterworth, Milton.
For Second Vice-President—H. H. Ganser, Morristown.
For Secretary-Treasurer—W. H. Merritt, Lebanon.
For Members of Council—L. R. Dutton, W. E. Anderson and Paul Mueller.

Of course the recommendations were equivalent to an election, and the "preferred" returned thanks for their elevation in suitable phrase. An adjournment to 2 P.M. was then ordered. The afternoon session was opened by the naming of Reading as the place for next meeting, which action was succeeded by the paper by Mr. George W. Thomson, of Chester, Pa., whose theme was "New Business Methods for Solicitors and Employees' Meetings." Owing to the regretable absence of the author the paper was read by Mr. Brown. Then followed the communication by Mr. W. H. Rhoads, of Williamsport, Pa., on "Profitable Gas Advertising." These papers were in reality jointly discussed, and the debate thereon was sufficiently lengthy to bring the first day's sessions to the hour for adjournment. The evening was very pleasantly spent, the special attraction being a visit to the Orpheum Theater, many of the winning sex joining in the journeying to the home of the merrymakers.—W. C.

HEPTASOPH HALL, April 14th.

Dear JOURNAL: Good weather continues and the interest in the session remains unabated. The proceedings for the day were opened by the paper on "Gas Meters from the Meter Man's Standpoint," by Mr. J. H. Mansur, of Royersford, Pa. And well did the veteran handle his subject, which is easily accounted for since his years in the meter making art have been many. The fifth number handled was an extra one, by Mr. W. O. Lamson, whose subject was the "Practical Value of a Combination Appliance," which brought out a lively discussion. "Coal Gas Manufacture" was the subject of a paper by Secretary Merritt. The unfortunate absence of Mr. Merritt caused the paper to be read by Mr. Lamson. The paper by Mr. H. D. Gillingham, of Wilkes-Barre, on "Water Heating and Type of Apparatus for Residences," brought the morning session to a close.

The afternoon session was most interestingly taken up in the listening to two lectures, by Mr. Norman Macbeth, on "Illuminating Engineering," the other by Mr. W. H. Fulweiler, on "Tar as Applied to Road Building." Both were of high order, and while naturally one would expect such from Mr. Macbeth, whose literary productions are always stamped by excellent wording and lighted by coherence, it was a decidedly agreeable surprise to find a new literary star in the person of Mr. Fulweiler. True, it is not that gentleman's first appearance in the paper field, and true it also is we hope it will be far from his last try therein. His lecture on the named subject will hold the premiership thereon in this country for some time to come. Each lecture was handsomely emphasized by a well-handled series of stereopticon views. I might add here that one of the attractions of Easton is a suitable and enduring granite monument to the memory of those who gave their lives in defense of the Union during the dark days of the early 60's. I do further add that its purpose and beauty are all the better thought out in times of darkness by means of a well-arranged system of Humphrey arc lamps. The banquet was brought off in the main dining room of "The Karldon," under the competent direction of President Holzer. The guests numbered 100, and these included Mayor McKeen, whose speech was an excellent speech and wise. The viands were good and the service was likewise; in fact, the only fly that stuck in the round of gayety was the failure of anyone to reply in the affirmative that he had "seen Kelly." Knowing your going to press time, this will be the last news by wire of the meeting, which is sure to have a busy closing, for the programme carries quite a few numbers which it will not do to slight. —W. C.

BRIEFLY TOLD.

CURRENT MENTION.—

MR. A. H. BARRET, for close on two-score years the Chief Engineer of the Louisville (Ky.) Gas Company—he was Chief Engineer in fact as well as in title—has resigned that position that he may enjoy the ease and freedom that come with the complete relegation of business cares. Sound in mind and body, and in the possession of everything needful for the maintenance of the life of one outside active business ranks, his determination no doubt is to be applauded; but those who have labored with him, in the days when the gas pathways were rather ruggeder than now, will miss him much. However, he retires with those honors which are vouchsafed only to those who have worked long, unremittingly and successfully. His successor is Mr. J. J. Humphreys, General Manager and Engineer-in Chief to the Brooklyn Borough Gas Company, Long Island, N. Y.

THE Connelly Iron Sponge and Governor Company informs us that after Wednesday next (20th inst.) its headquarters will be in the Graham Building, 127 Duane street, corner Church street, instead of 50 Church street as at present.

THE annual meeting of the United Gas Improvement Company will be held in the home offices, Broad and Arch streets, Philadelphia, the afternoon of May 2d.

MR. T. G. NAUMANN has been appointed official gas examiner for Port Huron, Mich.

MR. L. N. LINCOLN has notified the shareholders in the Mauch Chunk (Pa.) Gas Company that the annual meeting will be held at 2 P.M. of the 2d prox.

THE voters of Decorah, Ia., have formally ratified the ordinance recently passed by Council awarding to Mr. J. J. Donelan and associates, of Waverly, Ia., the right to construct and operate a gas plant in the named place for a term of 25 years. The promoters assert that they will be ready to supply gas in Decorah by November 1st. This syndicate owns the plants in Vinton, Anamosa and Waverly, Ia., and at Ames, same State.

THE Laclede Gas Light Company, of St. Louis, Mo., is making more than good progress over the task of pulling down the old benches to make room for the new full-depth 8's, 22-foot throughs. Up to the 8th inst. the first half had been torn out and the excavations for the new type had not only been completed, but a goodly portion of the new concrete foundation was laid. Quite a part of the materials for the benches is now on the ground. Engineer Little figures that the bricklayers will be at work about the 24th inst., when it is presumed the foundations will have been completed. The 20 full-depth 22-foot benches of 8's are being furnished and erected by the Evens & Howard Firebrick Company, of St. Louis, to their own designs, which were formally approved by the Engineer of the Laclede Gas Light Company, Mr. G. B. Evans.

MR. E. E. WITHERBY, writing to us under date of the 13th inst., informs us that the properties of the Shamokin (Pa.) and Coal Township Light, Heat and Power Company have changed hands, Mr. Witherby having assumed full possession thereof on the 5th inst. He was elected a Director in and Vice-President of the Company, and is now in complete charge. It is proposed to construct an entirely new gas plant and a new, enlarged and extended main system. The electric light section of the property is entirely up-to date.

Bureau of Information, The American Gas Institute.

Under the direction of the Institute it has been decreed: 1. That the privilege of submitting questions be limited to members of the Institute. 2. Neither the Board of Directors of this Institute, nor the Institute as a body, make themselves in any way responsible for the statements of fact or expressions of view given out by the Bureau of Information.

BUREAU OF INFORMATION, THE AMERICAN GAS INSTITUTE,
HEADQUARTERS, GAS OFFICE BUILDING,
V. F. DEWEY, Chairman. DETROIT, MICH., April 5, 1910.

The Chairman incloses Questions Nos. 65 and 66, with Answers thereto, as per the following:

Question No. 65.—"Under ordinary conditions, does increasing the yield of gas per ton of coal carbonized decrease the candle power?"

Answer.—A categorical answer to this question cannot be given. If an increased yield of gas is obtained by introducing diluents such as furnace gases or air, then the candle power would be decreased much faster proportionately than the make of gas increases. If the increased yield is obtained by operating the retorts under a reduced constant pressure, such as is possible with a first-class retort house governor, then the candle power will remain nearly constant and the B.T.U.'s will be slightly reduced. If it were possible to maintain zero pressure in the retorts, the yield would be at the maximum, the candle power slightly under the maximum, and the B.T.U.'s reduced about 2 per cent.

If the yield of gas were increased by lengthening the period of carbonization, thereby reducing the percentage of volatile matter in the coke (the additional gas being almost entirely hydrogen), then both the candle power and the B.T.U.'s would be reduced. The increased yields, due to higher heats, result usually in a lower candle power and B.T.U.'s. There will be some variation in this, however, dependent upon the kind of coal used.

In coke oven operation it has been found in practice that the yield of gas can be increased with no effect upon the candle power by running the oven at a more uniform pressure throughout the entire coking period.—V. F. DEWEY, Engineer, Detroit City Gas Company.

Question No. 66.—"Present plant conditions: Making 125,000 cubic feet coal gas per 24 hours. Holder capacity, 60,000 cubic feet. Contemplate putting in a small water gas set to make 20-candle power, carburetted water gas, to mix with coal gas. What effect will the mixing of water gas under the above conditions have on the mantle burners thoughout the town?"

Answer Submitted by H. Russell, Supt. Rochester Railway and Light Company.—The effect of mixing water gas of 20-candle power with coal gas, under the conditions stated, would not be noticeable in the mantle burners of the city, providing the percentage of water gas did not exceed say 50. Above this percentage a slight adjustment of the burners would probably be necessary in order to secure best efficiency and to prevent striking back of the flame into the mixer. This would be due to the change in specific gravity of the gas. Approximately the same quantity of air would be required for combustion of a 16-candle power coal gas and a 20-candle power water gas; and, with an admixture of water gas, such as the question evidently presupposes, I do not think the average consumer would notice the change.

[Communicated.]

Method for Keeping Accounts of Small Gas Concerns.

[By Mr. F. Lincoln Hutchins.]

This system is based upon uniform system of accounts, third condensed form, of the Public Service Commission, Second District, State of New York, and while the method of keeping accounts is applicable to those of the largest concerns, by the simple expedient of extending the schedule of accounts, it is here shown adapted for concerns having a gross annual revenue of less than $25,000 per year.

Small concerns of this character do not ordinarily have connected with them expert accountants, and the imperative requisite is that any scheme of accounting shall be void of technical accounting terms; that it be simple and exact; that there be but one entry for any item: that the place for every item be definitely fixed; that the place of entry be so exactly indicated that no hesitation occur in the placing.

Claim is made that this scheme fully complies with all of these conditions, so that the veriest tyro, even a schoolboy or girl, can correctly keep the accounts. This is further assured by provisions making it impossible for any unintentional error to pass through undetected.

Unlike the ordinary double-entry system there is no turning to a long list of ledger pages to draw off trial balances, the errors on which do not appear until such balance is drawn; neither is there the customary journal entries with their confusing debit and credit sides. To the contrary, only one entry of each item is permissible, both sides of which are to be entered on the one sheet and in line with the description of the item. This provision secures a continuous balance of each sheet, while the periodic carrying of the totals to the general balance gives an ever available trial balance and a daily check upon the accuracy of the work. Expert knowledge is not needed in the changing from any existing system, nor in closing accounts at any time desired, if the following instructions are observed. It is immaterial whether the sheets upon which these accounts are to be kept are in loose form or bound into books, but the loose sheet form is recommended as most convenient; these to be kept in binders for current use and bound together for a permanent record. With very small concerns one binder for all the sheets may be sufficient; with larger concerns the number of binders can be as desired up to the point of having a binder for each kind of sheet.

Accounting System.—A most convenient size for these sheets is 14 by 18 inches, but the size may be regulated by each concern to fit its safe capacity, providing the necessary number of columns is provided. In this method no entry can be made on one side of any account without requiring corresponding entry or entries upon the opposite side of the account; hence all of the various sheets must always be in exact balance. That is, the totals of all the figures upon the debit side must equal the total of all the figures upon the credit side, if the entries have been properly made. Any disagreement is easily located, as the erroneous entry must be upon the sheet that is out of balance. In order to locate the exact place for each entry the several accounts must be symbolized. This might be done for each grade of the accounting order, but in order that the symbols shall mean the same thing with all concerns of whatever size, and to provide for changing from one accounting grade to another without change of accounts, the extended scheme is lettered and numbered as a whole, only those applicable to the concern adopting this scheme being used in its accounts. The following is the suggested symbolizing. It will be noted that all of the capital accounts take place in the ledger, and that no other account is ledgerized; that the income revenue is lettered and that the expenses are numbered in groups, the reason for which will be apparent later. This system is equally applicable to concerns using a different schedule of accounts, by substituting that schedule for the following. It is also applicable to any business by the necessary modification of details to fit the business to which it is applied.

List of Accounts.—Schedule A: Balance Sheet or Indicant Accounts.

Fixed Capital.

		Ledger Pages.
G100.	Fixed capital, December 31, 1908	200
G110.	Land devoted to gas operations	202
101.	Organization	204
G102.	Franchises (gas)	206
G103.	Patent rights (gas)	208
G104.	Other intangible gas capital	210
G121.	General structures	212
G122.	General equipment	214
221.	Works and station structures	216
222.	Holders	218
G141a.	Furnaces, boilers and accessories	220
G141b.	Steam engines	222
G143b.	Gas engines	224
G145.	Miscellaneous power plant equipment	226
223.	Benches and retorts	228
G143a.	Water gas sets and accessories	230
224.	Purification apparatus	232
225.	Accessory equipment at works	234
231.	Trunk lines and mains	236
232.	Gas services	238
233.	Gas meters	240
234.	Gas meter installation	242
235.	Municipal street lighting fixtures (gas)	244
236.	Gas engines and appliances	246
237.	Gas tools and implements	248
238.	Gas laboratory equipment	250
239.	Other tangible gas capital	252
G281.	Engineering and superintendence	254
G282.	Law expenditures during construction	256
G283.	Injuries during construction	258
G284.	Taxes during construction	260
G285.	Miscellaneous construction expenditures	262
G286.	Interest during construction	264
O110.	Land in other departments	266
O102.	Franchises in other departments	268
O103.	Patents rights in other departments	270
O104.	Other intangible capital in other departments	272
O120.	Tangible capital in other departments	274

Floating Capital.

G10.	Materials and supplies	292
1.	Notes receivable	322
2.	Interest and dividends receivable	Ie
3.	Other current assets	324

Investments.

300.	Investments	294

Special Deposits.

311.	Coupon special deposits	296
312.	Dividend special deposits	298
313.	Other special deposits	300

Prepayments.

321.	Prepaid taxes	
322.	Prepaid insurance	
323.	Prepaid rents	
324.	Other prepayments	

Suspense Accounts.

331.	Unamortized debt discount and expense	302
332.	Other suspense	304

Reacquired Securities.

340.	Reacquired securities	306

Debt.

360.	Funded	308
	Unfunded	3
351.	Taxes accrued	310
352.	Receiver's certificates	312
353.	Judgments unpaid	314
354.	Interest accrued	316
355.	Dividends declared	318
356.	Bills payable	326
G357a.	Consumers' deposits—gas	320
357b.	Other accounts payable	
358.	Other unfunded debt	328

Reserves.

	Permanent	
371.	Premiums on stocks	330
372.	Other permanent reserves	332
	Temporary	
373.	Contractual	
	Non-contractual	
	Required	
374.	Accrued amortization of capital	334
375.	Unamortized premium on debt	336
376.	Other required reserves	338
	Optional	
381.	Casualties and insurance reserve	340
382.	Other optional reserves	342
	Profit or loss	344

Stocks.

390.	Stocks	400

Schedule B: Income Account.

Operating Revenues.

		Symbol.
431.	Municipal street lighting—gas	Ma
432.	Lighting municipal buildings—gas	Mb
433.	Municipal heat and power—gas	Mp
434.	Miscellaneous gas revenue—municipal	Mx
435.	Prepaid gas	P

	Symbol.
436. Commercial metered lighting—gas	Cl
437. Commercial heat and power—gas	Ch
438. Other gas corporations	G
439. Commissions on others' gas	Cg
440. Rent of gas appliances	A
441. Gas, merchandise and jobbing revenue	S
442. Sale of residuals and by-products	B
443. Joint gas rent revenue	J
444. Other miscellaneous gas revenue	X
OPERATING EXPENSES.—*I. Production Expenses.*	
601a. Works superintendence	2
601b. Boiler house labor	4
601c. Retort house labor	6
601d. Generator house labor	8
601e. Purifier house labor	10
601f. Miscellaneous labor at works	12
602. Boiler fuel	14
603. Water	16
604a. Fuel under retorts	18
604b. Coal carbonized	20
605. Coal gas enricher	22
606. Generator fuel	24
607. Water gas oil	26
608. Purification supplies	28
609. Miscellaneous works expense	30
610. Repairs of works and station structures	32
G508. Repairs of furnaces, boilers and accessories	34
G509. Repairs of steam engines	36
G511b. Repairs of gas engines	38
G513. Repairs of miscellaneous power plant equipment	40
611. Repairs of benches and retorts	42
G511a. Repairs of water gas sets and accessories	44
612. Repairs of purification apparatus	46
613. Repairs of holders	48
614. Repairs of miscellaneous equipment	50
615. Repairs of works tools	52
616. Gas storage	54
617. Gas from other sources	56
II.—Transmission and Distribution Expenses.	
631. Transmission pumping	1
632. Distribution superintendence	3
633. Distribution supplies and expenses	5
634a. Gas meter and installation work	7
634b. Work on consumers' premises	9
635. Repairs of gas mains	11
636. Repairs of gas services	13
637. Repairs of gas meters	15
638. Repairs of distribution tools	17
639. Repairs of gas appliances	19
III.—Municipal Street Lighting Expenses.	
641. Street lamp operating	21
642. Street lamp repairs	23
IV.—Commercial Expenses.	
G551. Commercial administration—gas	100
G552. Promotion office expense—gas	102
G553. Advertising—gas	104
G554. Canvassing and soliciting—gas	106
V.—General and Miscellaneous Expenses.	
G823. Salaries of general officers	31
G824. Salaries of general office clerks	33
G825. General office supplies and incidental expenses	35
G836. General law expenses	37
G837. Miscellaneous general expenses	39
G838. Insurance	41
G839a. Relief department expenses	43
G839b. Pensions	45
G840. Gas franchise requirements	47
G841. Residuals expense	49
G842. General amortization—gas	51
G845. Gas expenses transferred—cr	53
G846. Joint operating expense	55
G847a. Accidents and damages	57
G847b. Law expenses connected with damages	59
G848. General stationery and printing	61
G850. Store expenses	63
G851. Stable expenses	65
G852. Undistributed adjustments—balance	67
G853. Duplicate gas charges—cr	69
Taxes.	
G860. Taxes	It
G870. Uncollectible gas bills	Ib
Non-Operating Revenues.	
G901b. Rent accrued from lease of gas plant	Ne
G901d. Miscellaneous rent revenues	Nr
902. Interest revenues	Ni
903. Dividend revenues	Nd
904. Profits from operations of others	Np
905. Miscellaneous non-operating revenues	Nf

Non-Operating Revenue Deductions.

Non-operating revenue deductions	Symbol.
a. Rent expense	130
b. Interest expense	132
c. Dividend expense	134
d. Others' operations expense	136
e. Miscellaneous non-operating expense	138
f. Non-operating taxes	140
g. Uncollectible non-operating revenues	142
Income Deductions.	
921. Interest deductions	Ii
992b. Rent for lease of other gas plant	Ia
922. Other rent deductions	
f. Joint facility rents	Ij
g. Miscellaneous rent deductions	Ir
923. Sinking fund accruals	Is
924. Guaranties of periodic payments	Ig
925. Loss on operations of others	Il
926. Other contractual deductions from income	Ic
927. Amortization of landed capital	Im
928. Amortization of debt discount and expense	Id
929. Amortization of premium on debt—cr	Ip
Appropriation Accounts.	
931a. Bad debts collected	150
931b. Other additions to surplus	152
932. Expenses elsewhere unprovided for	154
933. Dividends on outstanding stocks	156
934. Amortization elsewhere unprovided for	158
935. Appropriations to reserves	160
936. Gifts to controlled corporations	162
937. Other appropriations	164
938. Bad debts written off	166
939. Other deductions from surplus	168

The first thing to be done is to have some competent party make up schedules of accounts containing only those items applicable to the concern adopting this scheme. These should be furnished in sufficient number to permit of each individual assigning items to accounts to have a copy for use. At first such party will have to refer pretty constantly to the list for the proper symbols, but they will soon be memorized so that reference to the list will be necessary only for the occasional item. Having prepared this list and drawn off the accounts from old books, as explained at the end of this article, the system is ready for current entries. Commencing with the charges against the plant, which are to be entered upon a "Purchase Register"—this is a sheet having columns as follows:

1. Date of invoices.
2. Name of creditor.
3. Progressive line number.
4. Posting reference.
5. Amount due creditor.
6. Freight and other charges over and above net invoice.
7. Ledger or capital accounts.
8. Production expense.
9. Transmission and storage expense.
10. Utilization and commercial expense.
11. General expense.
12. Merchandise and jobbing expense.

The last six headings to have three sub-heads, namely; a, Class symbol; b, Amount; c, Posting check.

The amounts shown in columns 5 and 6 are credit items, and all the other columns are debit items. The aggregate of all the amounts shown in columns 5 and 6 must equal the aggregate in all of the other columns, and if upon addition these do not prove it shows the work is incorrectly done and re-checking is necessary. No material is to be taken in without an invoice or memorandum, and these invoices or memorandums must bear a superimposed sticker, or rubber stamp impression, showing the following details:

Class number..... Amount $.....
Class number..... Amount $.....
Class number..... Amount $.....
Class number..... Amount $.....
Rec'd this.....day of..... 19...
by.....
Price and computation.....
Checked by.....
Entered Folio..... Line.....
Paid this.....day of.....19...
by check number.....

The invoices or memorandums must be placed in the hands of those who are competent to classify and pass upon the items. This is all the expert knowledge required, but the proper assignment to accounts must be carefully and accurately done, if the subsequent entries are

to be correctly spread upon the account. The amounts to be charged must include all freight, cartage and other charges that properly belong to the account to be charged. Very small concerns having but few invoices per month should enter them as soon as passed by the assigning authority. Larger concerns, with many invoices each month, may accumulate them in alphabetical order and enter up on purchase register in the same order at the close of the month. This will bring the bills of one concern together for the month.

It is immaterial whether checks are drawn for payment of bills before or after entering upon the register; those subject to a cash discount for prompt payment can be settled by check before entry and others after entry without causing any confusion. When ready to enter, the one keeping the accounts will enter the name of the creditor, the amount to be paid that creditor, the freight (or other) charges rightfully chargeable to the account covered by the items of the invoice, then distribute in the debit columns in accordance with the symbols shown at the top of the superimposed sticker or impression. When entering invoices on which checks have been drawn prior to such entry, which fact is shown by the entry at the bottom of sticker or impression, the check number must be entered in the column headed "posting reference." After the entry is made and verified the folio and line number must be entered at the bottom of the sticker or impression upon the invoice as there provided for. No other entry need be made, nor need a customer's ledger be kept, although such ledgerizing may be done if thought worth the trouble; but in case this is done it must be done in books entirely separate from this system and become no part of it.

In addition to this purchase register, sheets must be provided having columns headed with the different accounts, carried by the concern with their symbols. At convenient seasons the items in the several columns of the "Purchase Register" will be drawn off upon these sheets, thus arriving at an aggregate for each separate account. By having these sheets correspond with each column, is provided a check upon the right entry of the original item, or, if wrongly entered, there will be no place upon the sheet wherein to draw it off. Another check is in totalling these sheets, each one of which must agree in total with the total of the column in the "Purchase Register" from which it is drawn. By carrying forward totals until the end of the year, the last total becomes the proper entry to make in the report forms prescribed by the Public Service Commission without further computation or assorting of items.

Closely connected with the "Purchase Register" is the "Bank Register," which is a necessity in this scheme, and is used to obtain a cross check of debits and credits in the liability account, by which the amount outstanding is always available. This register has columns as follows:

1. Date.
2. Deposits.
3. Interest upon deposits.
4. Number of check.
5. Amount of check.
6. Date of check.
7. To whom payable.
8. Posting reference.
9. Creditors' debit.
10. Discounts, allowances, etc.
11. Ledger or capital accounts.
12. Customer accounts.
13. Expense accounts.
14. Income accounts.
15. Merchandise and jobbing.

The check number can be made identical with the folio and line number by using the two right-hand figures of the check numbers for the line numbers, and the other figures of the check number as a folio number. In case two or more sheets should have the same folio number under this arrangement, they can be distinguished by lettering them a, b, c, etc. This is an advantage in checking. All invoices should be paid by check, and the check record should have the folio and line record of the purchase register as shown by the sticker, or impression, upon the bill itself.

The payment should cover an amonnt represented by one or more entire invoices, and while it makes awkward entries to split the payment of invoices, same can be done when necessary by making proper notations upon the "Purchase Register," leaving the unsettled account open until fully paid. For all payments of invoices that have been, or are to be, entered upon the "Purchase Register," the record of the check, the amount charged to creditor and the discounts or other deductions from same are the only entries needed. It will be noted that the amount of the check, plus the amount of discount or allowance, will equal the total debited the creditor, and that the amount debited the creditor will equal the amount credited that creditor in the "Purchase Register." When check is drawn, after the entry upon the "Purchase Register," which should be the general rule, the folio and line number, as shown upon the bill or invoice, should be entered in the column headed "Posting Reference," to facilitate the checking of same and prevent wrong checking.

When checks are drawn for payments, other than for charges which are to be entered upon the "Purchase Register," such for instance as cash transactions, the amount must be classified as is the case with invoice, and be made a part of the check record and the item or items entered against their symbols in the appropriate column, leaving the creditor and deduction columns blank. If the work is correctly done, the total of the items in amount of check column, plus the amount in the discount and allowance column, will agree with the total of all the other columns. Any disagreement should be located and corrected at once. Frequent proof by addition will make the search for errors a short and simple matter.

The difference between the sum of the deposits, plus the interest on same, less the amount of checks drawn, must be the amount of the true bank balance so far as the accounts go, notwithstanding that the actual cash in bank may be largely in excess of this amount, due to the non-presentation of checks that have been drawn. All items appearing in debit to creditor column must be checked with the "Purchase Register" by entering on the latter the check number, which is the folio and line number of the bank register; the bank register showing the folio and line of the "Purchase Register" upon the original entry. In cases where the check was drawn before the entry upon the "Purchase Register," the checking is reversed; that is, the check number appearing upon the "Purchase Register," the checking is accomplished by entering upon the bank register the folio and line of the "Purchase Register" after the entry is made. This checking should uncover any errors made in drawing checks for different amounts than entered into the accounts.

(To be Continued.)

[Proceedings, as Furnished by the Secretary.—Continued from page 682.]

FORTIETH ANNUAL MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Held at Young's Hotel, Boston, Mass., Feb. 16 and 17, 1910.

First Day—Afternoon Session.

A Try at the Question Box.

The President—There is a question in the Question Box:

"Can steam blowers be used for returning flue gases under the grates in bench furnaces?"

Part of the success at Worcester is due to the returning of the flue gases under the furnaces, and the question is whether they can be returned with a steam blower. Can anyone answer the question? Mr. Barnum, can you answer that question?

Mr. Barnum—I don't know what a steam blower is.

The President—I imagine it means a steam injector.

Mr. Barnum—I don't know, I never tried one.

The President—We have used steam blowers for increasing the draft, or rather, creating a forced draft under the boilers, so that breeze or other low grade fuel could be burned. I think this could not be used for returning part of the flue gases, under the furnace.

The President—This morning we elected two honorary members, one of whom is now present. I would be glad to have him stand up and say a few words to us. Col. Spaulding.

Col. Spaulding—Mr. President and gentlemen of the convention: I appreciate very much the compliment you have paid me, and I hope to be with you for many years to come. I thank you.

The President—The Secretary would like to call the roll at this time. If names are called, and any of you know that the gentlemen are here, although they may not be present in the room at this moment, will you kindly answer for them.

The Secretary thereupon called the roll:

ROLL CALL.

Honorary.

Benson, Col. F. S. Bradley, Wm. H.

Active.

Africa, W. G.	Coyle, P.	Gifford, N. W.
Allen, B. J.	Crafts, H. C.	Goodwin, F. A.
Anderson, W.	Dolan, J. B.	Gould, J. A.
Barnes, A. M.	Earle, A. G.	Gould, V. K.
Barnum, D. D.	Eccles, A. D.	Hintze, T. H.
Bill, B. P.	Ellis, J. W.	Humphreys, C. J. R.
Cheney, H. N.	Erhard, T.	Humphreys, J. J.
Coggeshall.	Fish, R. E.	Jenks, L. M.
Cook, R. W.	Fowler, S. J.	Jennings, F. A.
Cooper, A. F.	Gifford, C. H.	Johns, L. B.

Kelley, H. H.	Norton, H. A.	Snow, W. H.
Kennedy, J. P.	Norton, W. F.	Spaulding, C. F.
Lamson, C. D.	Norton, P. T.	Spaulding, C. S.
Lawson, W. H.	Nute, J. E.	Spear, J. N.
Learned, W. A.	Nutter, E. J.	Stearns, C. F.
Learned, C. A.	Nutter, J. J.	Stone, A. F.
Leonard, C. F.	Peebles, E. C.	Tenney, A. B.
Mace, F. W.	Prichard, C. F.	Thayer, W. F.
Mansfield, G. W.	Prichard, C. R.	Tinker, O. R.
McKay, W. E.	Philbrick, J. E.	Travis, F. M.
McKnight, G.	Polk, R. W.	Walker, W. L.
McQueston, W.	Quinn, A. K.	Wing, J. F.
Miller, C.	Richardson, F. S.	Witherby, E. E.
Morrison, H. K.	Sargent, F. H.	Wood, W. A.
Nettleton, C. H.	Scranton, G. H.	Yorke, E. H.
Norcross, J. A.	Shelton, F. H.	

Associate.

Barnes, F. S. P.	Hinman, C. W.	Stafford, W. R.
Beardsley, A. P.	Holmes, R. E.	Stiness, G. A.
Bradley, G. R.	Humphreys, F. W.	Stetson, G. R.
Buckminster, R.	Kerr, J. B.	Tufts, J. P.
Burr, A. R.	Mace, S.	Waldo, J. A.
Bush, C. A.	Motley, G. S.	Ware, R. C.
Caldwell, G. A.	Murray, J.	White, H. E.
Chisholm, C. F.	Norton, A. E.	Wilder, C. C.
Crowther, A. W.	Osborne, R.	Wilien, L. J.
Dunbar, A.	Paige, C. E.	Wood, G. B.
Eccles, G. W.	Piser, T. H.	Woodbury, H. C.
Griswold, C. S.	Potter, T. J.	Wrightington, E. N.
Haddock, J. T.	Pratt, F. S.	

A Word from the Man from Gloucester.

The President—A few minutes ago I was called to the telephone, to find that Mr. Coffin was on the other end of the wire at Gloucester. He said he was flat on his back, but that he had had the telephone brought to him. He wanted to thank the Association for electing him Vice-President, said he appreciated the honor very much, and assured me he would do all he could to help the Association.

Adjourned to 10 A.M., Thursday, February 17.

Second Day—Morning Session.

The President—Gentlemen: We will now take up the paper by Mr. Alfred R. Burr, of New Haven, Conn., on

MAINTENANCE AND SELLING METHODS OF GAS LAMPS.

At one of the meetings of this Association the President said: "Co-operation is in the air; it is the very spirit and life of our Association. In no finer way can we magnify the Association than by living up to the principle, 'each for all, and all for one.'" With this sentiment, so well expressed, a request to present a paper concerning the maintenance and sale of gas lamps could not be gracefully refused. The methods used at New Haven are largely the result of our experience, together with that of other companies; and, while there is no claim for superiority, thus far results have been good.

First, let us consider briefly the condition of gas lighting as viewed by those interested in electricity, and largely shared by the public previous to the introduction of perfected gas arcs and inverted burners. Perhaps a quotation from Prof. D. C. Jackson in the *Electric World*, January, 1901, will best serve to illustrate this. He stated that "Tallow dips and lard oil had been superseded by the use of refined petroleum and illuminating gas, and that within the past two decades they in turn had been outmatched in public favor by electric light, until the lighting of streets and public places is almost uniformly performed by electric arcs, while the incandescent electric shines in the stores and dwellings."

Following close on this statement, and during the same year, at one of the gas association meetings, a new style cluster gas lamp was exhibited and a paper read on the subject. At this time an effort was also made to organize a company to manufacture gas arc lamps; but capital could not be secured, so firm was the belief that gas was out of the question and that the light of the future would be electricity. Since these events manufacturers and gas companies have offered and installed improved gas lamps, and a very considerable portion of gas manufactured continues to be used for light. How best to keep and to increase the lighting business is still a problem, but one which can, in my opinion, be answered in great part by offering good maintenance service at reasonable cost, and thereafter taking pains to secure contracts.

It is quite well known that new-style gas lighting has superseded the old to a very satisfactory degree, and that the sale of cluster lamps means a greater return to the gas companies than that of a double-oven gas range, which shows how important it is that companies selling gas for illumination should interest themselves in the care of burners where consumers will not—and experience proves they will not—and to see to it that gas lighting is always maintained at its highest efficiency, which insures good light always, at any time.

From 18 arc lamps in the following places of business, 1 real estate office, 2 grocery stores, 1 meat market, 1 bakery, 1 saloon and 1 news store, we find the consumption amounts to 445,300 cubic feet for 12 consecutive months, or 24,739 cubic feet per arc, equal to $23 50 per arc per year—gas at 95 cents per 1,000 cubic feet. This may be termed long-hour lighting and was figured to find what the revenue would be from this class of lighting.

In New Haven all lamps and burners are sold outright and become the property of the consumer absolutely. Prices for burners and fixtures show a loss on some types and a small profit on others. Our terms are liberal, as lamps are offered on the installment basis, or with a discount for prompt payment. An allowance of 10 feet of piping for each arc is made if an extension is required. Commissions on sales are paid to regular canvassers of the Company and the dealers.

We sell only one make of inverted single burners, one of upright and inverted arcs, and do our best to secure a signed contract to maintain them at the time the sale is made. Failing in this, our plan is to make two or more special calls to procure this contract. If not successful, the object is finally left for a canvasser, who makes it a part of his business, and for which the Company pays 50 cents for an arc lamp contract and 25 cents for an inverted burner contract, regardless of the number of lamps thereon.

When a contract is made to maintain old lamps (that is, lamps previously installed and used) we make a charge for material only that is furnished to put the lamp in good condition, and thereafter the charge is at the regular rates, dating from the 1st of each month, with two inspections per arc lamp per month and one inspection per inverted burner per month.

Copies of our maintenance contract blanks are shown.

Form 1,054.

No.	Appr.	1st C. O. No.
Card No.		Maint. Slip
Badge Order		Addgr.

MAINTENANCE AGREEMENT.

New Haven, Conn., ...19 ...

To the New Haven Gas Light Company:

The subscriber requests the New Haven Gas Light Co. to maintain, by replacing glassware and mantles broken or giving poor light, and to clean twice a month, until further notice in writing, ...
Gas Arc Lamps at No .... St., ...
commencing .... 1st, 19 ....., for which service *Subscriber agrees to pay for materials used when lamps are first put in good order*, and thereafter the monthly rate of 20 cents per lamp.

Note.—By payment of $2 per lamp *in advance* this service will be rendered for 12 consecutive months.

Subscriber.....
Address .....
Business.....
Total No. Lamps at this address..... .....
..... Solicitor.
Remarks:

Discussion.

The President—Mr. Burr has given us a very interesting paper, and it is so much in detail that anyone, taking this paper and the blanks, even if he is not now maintaining arc lamps, can proceed to install and handle them successfully according to this system. The paper is now before you for discussion. Mr. Burr will be very glad to answer any question that any of the members or our friends may ask. If Mr. Ware is in I would like to have him open the discussion.

Mr. Ware—Our friends (the electric people) here in Boston have a saying that a "satisfied customer means 10," which they repeat at every possible opportunity. There is a great deal in that, of course, and we on the gas side have to make sure we are bringing in our 10 new customers for every satisfied one, by making sure that our own customers at the present time are satisfied. The only way in which we can be sure of doing this is by adopting (the sooner the better) some such system of maintenance as Mr. Burr has just described. I am sorry I cannot contribute anything to the discussion from actual experience, as we have practically no system of maintenance in Boston, except the tentative schemes adopted by private concerns for experimental purposes. I hope, however, that we shall be able to take it up fully in the near future. There are a number of questions I

want to ask. Does Mr. Burr maintain any lamps whatever which he finds on his district, or does he confine his work to the particular types of lamp which they recommend and supply themselves? Further on Mr. Burr refers to a commission basis for lamps cleaned in excess of 240 per week. This seems a little dangerous, as a possible incentive to incomplete work or, possibly, inaccurate reports. It would be interesting to find out whether there has been any trouble from that source, and, if so, how it was overcome? Referring to the blank ordering cessation of maintenance, I should like to know if there have been many contracts terminated, and what the general reason given was. Is the system on the whole considered satisfactory by the customers, and what expressions have been received in that connection? Getting down to detail, do the trimmers have to account for the new mantles and glassware by turning in the old that they collect, or does the report simply state the mantles used without any check? It seems possible that, dealing with the really large number of contracts which the New Haven Company has on this system, it may have had a number of complaints that the work was not done as reported by the trimmers, and it would be interesting to find out whether this is a negligible factor. For laying out a system of maintenance in a new field, it would be essential to know the number of calls which can be made by a trimmer on an average through the year, and the average number of lamps which he can care for per day. While there is no proportional charge for general office expense, I suppose that specific charges for clerical work in caring for the system are included. The mantle dust amounts to a very creditable figure. Are the mantles turned in with the asbestos cord, and separated by the person to whom you sell them, or is that separation made by you before disposing of the dust? The point about the quality of incandescent gas light is something we cannot urge too strongly. We have the best artificial light there is, and most people, except the electric authorities, agree about that. It would be interesting to those of you who have not already seen it, to read the article by Dr. Steinmetz in the "Transactions" of the American Illuminating Engineering Society, January, 1909, on "Light and Illumination," a very interesting and valuable contribution to lighting literature. Dr. Steinmetz, who is one of the chief authorities on electricity in the country, is high up in the General Electric Company, but almost everything he has said in that article about light is indirectly a boost for incandescent gas light. Mr. Burr's conclusion about the importance of keeping up in the study of light and illumination is certainly very pertinent. We on the gas side have to take the matter up more and more systematically, and I hope that everybody who can possibly do so will help the Illuminating Engineering Society in its work, and help it to keep an unbiased organization representing the study of light as such, and having among its membership and its active workers gas men as well as electrical workers.

The President—Mr. Nute, of Fall River, has a large number of arc lights.

Mr. Nute—At present we are not maintaining such a very large number of arc lights, the total at the present time being only somewhere in the neighborhood of 300. We have for several years preferably developed the system, where we have put in a good sized installation, of carefully instructing some employee who made it his business to attend to the lamps, with occasional suggestions from our men, rather than to do it ourselves. That has proved in many instances very satisfactory, in other cases not so much so. When we have been able to get hold of a good employee of the concern, who has been interested in the work, he, being on the ground all the time, could do better than we could, making visits two weeks apart. In some instances it has proved very satisfactory, indeed; but, as I said, in some others we have not been able to get such a man, and we have been endeavoring in those cases, and have succeeded in most instances, to get the work turned over to the care of our men on the maintenance system. Nearly half of the arc lamps that we have maintained are outside arcs. For outside arcs we charge 50 cents per month for maintenance, for inside arcs 25 cents, and it has proven so far that we are a little ahead of the game. We are apparently making a little money on them. It seems to be very essential, except in the case of large installations, for the company to maintain them; for we find where people have only two or three arcs that the other system does not seem to work so well, as there are not enough lamps to make it worth while for any one man to have it his special business to look after them. We have several good-sized installations in some of the mills where we have worked the other system, and it has worked very nicely, as well as in the case of some of the larger installations in stores. We are tending more and more, however, to the system of having our men look after all installations, except in the case of those that have been in operation for some time, and where the people have had good success in looking after them themselves.

The Secretary—Mr. President, we have in a small way been doing maintenance work for a little over three years, but, as these figures will show, it is still small. We have on contract 180 arcs, 138 single upright burners and 354 inverted burners. I have figured out a scheme of lamp months, which I hope will be intelligible, and I have the labor per lamp month and the mantles, which will allow anyone to apply his own labor schedule and thereby to get at the cost. On the arcs: 2,574 lamp-hour months took .58 of an hour labor per month and .76 of a mantle per month. Total cost for material, 8.48 cents; total cost for material and labor, 19.93 cents per month, which, by the way, is quite close to New Haven's figure. That only includes material used and the labor put onto the work of taking care of the lamps, with nothing for clerical work, etc. For the single upright burners there was an equivalent of 718½ lamp months. The labor was ½ of an hour per month per lamp, at a cost in our case of 6½ cents, with .55 of a mantle used per month; the total cost being 13.1 cents. For the inverted lamps, the equivalent of 1,525½ lamp-hour months, the amount of labor was .37 of an hour per month, costing in our case 4.45 cents, .24 of a mantle per month—making a total cost of 11.8 cents. I might say in this regard that it requires a pretty good man to do good, conscientious work in this line. We pay a varying scale of wages on this work, but we must have one good man to look after it, and have to pay him good wages. He is held responsible for the condition of the work. It might be interesting on the general question to know what the other costs are which, in my case, I cannot tell. I hope there is someone here from New York who can give some information as to their methods. I had the pleasure of looking over their system last fall. They have gone into the matter very exhaustively, as you may imagine from your knowledge of the gentleman who is at the head of it. They keep a very elaborate system of cost reports, and their charges, other than for material and labor, I should say pretty nearly equal those for material and labor. As Mr. Ware has said, it seems to me the matter of 240 lamps per week would require some supervision, so as to be sure that it did not lead to some unfortunate conditions. I would like to ask Mr. Burr if his men clean all the glassware; that is, globes, reflectors, etc., every time. In the summer time, in grocery stores, for instance, it adds materially to the amount of time which a man must put on the job, if he is going to clean thoroughly all the glassware. There is a field of maintenance which, so far as I know, is not very fully covered. To my mind it is an important field and one that we really must get into, and that is the domestic lighting. We have done very little of it, and I think that some other system than this contract system, which has apparently worked out very successfully in many places on commercial lighting, and especially arc lighting, must be found. I have made some attempts at it, but thus far without success. I think there are one or two companies represented in the Association which have had greater success than we have, and I hope their representatives will be here to speak on this question. There is a system—I believe they call it the "Call Inspection System" which possibly may work out. As an illustration of the condition of mantle lighting, I might refer to an investigation which I heard of recently in a typical gas lighted section, where the inspection showed one-third of the mantles in good condition, one-third in fair condition and one-third in bad condition. It seems to me it needs nothing said to prove that some system of maintenance is absolutely necessary there for the proper rendering of the service which we are all trying to render to our customers.

Mr. Nute—One question I should like to ask, which I think is quite generally overlooked, is whether or not these costs which are given by Mr. Gifford, as well as by Mr. Burr, include the occasional renewal of mantles and the labor required between inspections? They do not in the figures I gave. Of course, there are always more or less mantles broken between inspections, which we have to send out for and take care of.

The Secretary—I can say in my case that they do. We hold ourselves ready to go on call and make replacements.

The President—I would like to hear from Mr. Buckminster, of Lowell.

Mr. Buckminster—The 1st of January, 1910, we had 4,019 regular upright arcs and 230 inverted and 23 reflexoliers, making a total of 4,272. The figures I will give will not include the reflexoliers, but will include the upright and inverted lights together. Practically

all of these are on the maintenance plan. We sold very few outright, scarce enough to mention. We clean and inspect them, on a monthly basis, with the exception of probably 150 lights, and which are on a 2-week basis. If anybody complains that he is not getting good attention we put them on the 2-week basis; but I think the fact that there were only three calls to clean lights during the whole year shows that the monthly inspection is quite satisfactory to most customers. The trimmers clean practically 240 lights per week. They average that right along, and the same fact, that there were only three calls for lights to be cleaned, shows they did their work in an efficient way, at that rate. The total cost of material will average nearly 8 cents per light per month, and the total cost for mantles will be about 6 cents. The average cost per lamp per month was 13.9 cents, which includes the cost of all glassware, mantles, in fact, everything, with the exception, of course, of interest on the money invested and depreciation.

The President—Is labor included?

Mr. Buckminster—It included all labor. We figure that the average cost of installation is $1.37 per light, which also includes the labor account. I can't say very much about the single burner and inverted lights. We have 240 on maintenance, 113 of which are in one shoe shop. On account of the very poor mantles we have been receiving lately our maintenance costs are way up in the air. We tested a number of mantles and found 75 per cent. were of no use whatever.

The President—We would be glad to hear from Mr. Wainwright on this subject.

Mr. Wainwright—As I did not arrive until late, Mr. President, I am not prepared to talk upon the subject of maintenance excepting generally. In the companies with which I am familiar the maintenance question is one which in many cases is handled in connection with the free installation of lamps, and that is particularly true in cities where we have competition. We figure that a 4-mantle lamp should be maintained for about 20 cents, and that the number of mantles would be in the neighborhood of ¼ mantle per lamp month. Those are the only figures I have in mind at the present time.

The President—The Secretary mentioned the New York system. Is there anyone here from New York who can tell us about it? We will be glad to hear from any of the members without calling specially upon them. If anyone has any questions to ask Mr. Burr will be pleased to answer them.

Mr. Farrow—It may be of some interest to know the system we have in use in Cambridge. We sell the arcs outright at near cost, with free maintenance, not including globes. We find the average cost of maintenance per year is about $1.17 a lamp; that is what it has been for the past year. We have on the free maintenance system about 1,060 lamps. We sell the lamps with the understanding that the customer will use reasonable care in pulling the chains, so as not to blacken the mantles and ceiling. In the case of glassware the storekeeper or the proprietor, wherever the lamps are, pays at cost for any breakage. This system has proved very satisfactory. It has given us a great many customers who are very pleased with their installations. We have these lights out under most all conditions; in laundries, stores and factories, and they have given practically no trouble. There has been no abuse of the free maintenance system. I should say that the average call made by the men would be, in the case of laundries, once in 3 weeks, in a great many stores once a month, and in some cases as often as once in 2 weeks. The men are all instructed before they go out; they are thoroughly drilled in the use of the lamps before they leave the office, and when they are put on the work each man is responsible for the work he does. We always ask, wherever we install the lights, that the customer cooperate in keeping them in good order. Quite frequently I look around to see how things are going, especially in the evening, which is the best time, and in that way we have followed up the system of satisfying a customer with his arc lighting. During the past year we have installed nearly 1,000 of the inverted lights. We sell these lamps at about cost and charge the customers for renewals, charging them the cost price of the mantle and inner cylinder or shade. We have not gone so far as to get any definite figures on this subject, but hope to be able to supply them in the near future.

Mr. Leonard—Mr. Farrow speaks of 1,000 lamps. Are they in clusters?

Mr. Farrow—We have a good many 2, 3 and 4-light clusters; also, a good many single units.

The President—Mr. Cooper, we would be glad to hear from you on the question of the maintenance of arc lamps.

Mr. Cooper—In our small works we have no system of fixed charge for maintenance, but do hold a general supervision over all the lamps in the town. It being a very small place, of course, we can do this not only in commercial lighting but also in house lighting. We have a great deal more trouble with the lamps of the inverted type—I am speaking of the single unit—than we do with the upright, on account of the fact that, in a great many cases, the consumer thinks he knows better how to regulate the burner than the gas company—that is, after we regulate it the gas consumer regulates it to suit himself. It requires a careful man to regulate the lights properly. In my observation of the men they are inclined to give the burner too much gas, which means that the light will not work as it should. If you give just enough gas for a fair light, you will find that the light will increase as it burns.

The President—Mr. Fowler, we would like to hear from you. Mr. Morrison.

Mr. Morrison—I do not believe I can add anything to the discussion except, perhaps, in a general way. There seems to be doubt in the minds of some that this thing is necessary. I think if anybody will visit a town where maintenance is not in vogue and compare that with a town where maintenance is in vogue, he will be converted. I think we all believe that a satisfied customer is one of our best, if not our only business asset, and it is up to us to have our customers satisfied. There certainly is a need of some maintenance system to be adopted by a gas company if they want maximum efficiency and satisfied consumers. As to costs, I do not feel capable of making comparison, because the number of lamps maintained in my town is so small in comparison that I would not be able to give anything of value. I notice that the cost is generally the same, about 20 cents. I thought the number of arcs inspected per day would run higher than 40 lamps. Forty lamps per day means almost 15 minutes to a lamp, but that shows good work, I believe, and it is better to err on the side of excellent maintenance rather than low maintenance cost.

Mr. F. W. Humphreys—I think I might say hardly any of us have yet taken up the matter of maintenance on broad enough and general enough lines. I like what Mr. Gifford said, that we should have it for domestic lighting as well as for all sorts of gas lighting. In Poughkeepsie, which has only about 27,000 population, we take care of 295 single burners as against 296 arcs, but we are going into it a great deal more this year and on a good deal broader lines. That is a town where we have gas and electricity both. The Lowell gentleman mentioned the fact that his men only make one trip a month, which seems to me hardly adequate for good service, and hardly sufficient attention to expect people to go onto maintenance. I should like to ask Mr. Burr if he sends a ladder with the men at all, or whether they just use a suit case, finding a ladder where they can; also, if there is anybody in the room who has used a 3-wheel motorcycle, as I understand they are using it in Philadelphia, for carrying the supplies, a ladder, etc.

The President—A few minutes ago I asked Mr. Barnum to tell us about maintaining arc lamps in Worcester. He was not then present, but I see he has since come into the room, and we would like to hear from him now.

Mr. Barnum—We have maintained arc lamps for several years. We do not sell them, we rent them, the argument being that if we own and take care of them we will be sure they give satisfactory service; whereas, if the customers own them, they are not so apt to be taken care of. I was interested to hear Mr. Burr say that he considered an arc lamp a better consumer than a gas range. Our experience has been the same. The point he raises about the maintenance of electric lights, both arc and incandescent, costing more than it does to maintain gas lights, I think is a very important point to be dwelt on especially. We have some single burner, inverted lamps which we are maintaining under rather severe conditions. The post office is equipped with some 200 single burners, and there are two factors which make it rather hard service: One is that they burn a great number of hours, which, of course, is what we want; the other is that they are fastened to an unstable fixture. But notwithstanding this severe service it is very satisfactory business. If the same business could be done under less severe conditions it might be done at a good profit.

The President—Mr. Crafts, of Pittsfield.

Mr. Crafts—As I came in only a minute ago I have not heard much of this discussion. I don't know that we have done anything particularly interesting in the matter of maintenance at Pittsfield. We have not made any particular changes in the last 2 or 3 years. We

are maintaining something like 1,000 lamps, with free installation and free maintenance. Our maintenance costs are about $1.60 a year. As I remember it we use about ¾ of a mantle per lamp per month, and do restrict the installation of the lamps to places where we are sure of getting a good output. In other words, we do not put lamps into places where they will only use them for an hour or two a day. More than this, we check up our lamp installations every 6 months, and if the lamps are not burning an average of 1,000 feet a month, we either remove them or lease them upon a rental basis. If they are burning 1,000 feet a month, or 12,000 feet a year, we maintain them without any cost to the customer. We have two men on this work, who get around just as often as they can, usually about once in two weeks. As to the matter of house maintenance, I think that gas companies—I feel pretty strongly about this, and I know that we are negligent, although no more so than any of the other companies, perhaps—are all pretty slow in taking care of burners after we put them out. With us we have strong electric competition, a rival company, and the electric lamps are all maintained without any charge by the electric company, and we fight very hard for gas lighting. That is, while we do not neglect the fuel end, we do push the hardest for the lighting end. We run every building permit on a card system. That is, take a 3-apartment house, as soon as we have the piping and fixtures in, we issue 3 cards against that house, and our solicitor is supposed to follow them until they have a range and until they are using gas for lighting. It doesn't make any difference whether the house is wired; we see to it that every house is piped; and last year, out of several hundred houses, there were only 4 in the city of Pittsfield that were not piped. When it comes to maintenance, we put these burners in and then we drop out. We are just starting in on a scheme now—how successful it is going to be I don't know—but we started with a list of 500 customers, who are all in one section of the city, on a free inspection basis. By "free inspection" I mean that an inspector from our office will go once a month and look over the burners. If the mantle is blackened or a slight adjustment is needed, we propose to take care of that, but any renewals of mantles or chimneys are charged to the customer. We have a regular blank that the customer signs, so have a guarantee that the charge is all right. How that is going to work out I do not know, but from the little we have done with it, it looks as if the mantles and chimneys we shall sell would pretty nearly pay for the service. If it does, it certainly will bring increased satisfaction to our customers.

Mr. Learned - As matter of general information, and for the benefit of those gentlemen who run combination companies, I would like to have the privilege of asking Mr. Crafts if he knows whether the electric company in its renewals of lamps includes tungstens?

Mr. Crafts—No, they do not include tungstens; that is, they do not advertise to do it. [Laughter.]

The President—Anything further on this paper? If there is to be no further discussion I will ask Mr. Burr to answer the questions, and then that will close the consideration of the paper.

Mr. Burr—Mr. Ware asked the question if our Company maintained all the lamps there are in use; that is, the different varieties or different types. I will say that, as far as the gas arcs are concerned, there is only one type in use in New Haven—that is, to any extent; and the arcs of a type that the Gas Light Company do not sell we do not pay any attention to, so far as maintenance is concerned. The same thing applies to the single inverted burner; that is, we only maintain the burners that the Company sell. I am glad Mr. Ware asked this question, because it seems to me a vital point in our lighting is the maintaining of all gas lamps. I have chosen to take the stand that the gas companies will, sooner or later, of necessity, as a protection to their lighting interests, have to maintain perhaps all gas lighting. It may be my stand is extreme, but I am in such close touch with the consumers that I feel I know generally how they feel about unsatisfactory light; and if you can give a consumer a light, or a gas appliance of any kind, that makes him little or no trouble, he is apt to continue its use. Mr. Ware asked about the commission that the Company pays for over and above 240 lamps cleaned in a week. The men doing the work are, first of all, trained in the department before they are sent out. We have somebody who understands the lamp, who can take it all apart and show a new man how it is put together, etc., etc., so he may become familiar with it. Then we have someone give the new men instructions about adjusting; after this we send them out a day or two with one of the experienced employees who does maintenance work. The new employee is hired on a weekly salary basis, and after he has worked a few weeks or months, in order to find the amount of work, or his speed, we offer a commission of 5 cents per lamp. We haven't yet found that where they have earned any money over and above the 240 lamps cleaned in a week that it was really detrimental to the maintenance system; in other words, we haven't found where the work was neglected or not properly done because of this commission offered. We realize there is a little risk, perhaps, and only a partial check against this arrangement. The special calls are attended to by men in the fitting department, and if we find that a person whose lamps are on contract is making too many demands on us in a month, or through the season, we endeavor to find out whether it is the fault of the employee, or whether it is on account of conditions, that extra attention is required. That is the only check we have against the commission plan. Mr. Ware asked about the contracts for terminating maintenance, and how many we have had. We have no account of the number discontinued in a month or year, but we do have a number of customers who use their light for only a certain number of months. For instance: For a factory, they want the light only through the winter months, and then they will discontinue. Whenever we get a notice to discontinue maintenance, it is followed to find out why; and if we find that the man has discontinued because he has had poor service, we make every effort to straighten that out, to make matters right and to win him back. On the other hand, we sometimes find that, unknown to the Company, they have changed to other lighting. In that case we oftentimes get them back by following it up promptly. Our system, generally speaking, I think—in fact, I know—has been satisfactory to the customers. The number of complaints we get in proportion to the number of lamps we are maintaining I can safely say is very small; that it seems to me, in a general way, at least, it is pretty safe to take the stand that if a man is paying for something he is not getting he will very soon let you know about it. We have no one to follow systematically the work that the men do. We frequently, however, do send out an inspector in special cases. Mr. Ware also asked how we checked the stock given to the trimmers. That detail is taken care of in this way: They make an order on the storekeeper for material required; that is done in the morning. At night, when they return, they make a return order. The difference is checked against the clearing slip; that is, the material used is shown on the clearing slips and it is balanced daily. If there is a shortage, we want to know why and where it is. As to the number of calls and the lamps cleaned per day. In New Haven our district has been extended in the past two or three years so that we are not at present able to make quite as many calls in a month, or visit quite as many lamps, as we could before our mains were extended. In other words, we have lamps on contract distant seven or eight miles from the main office and, of course, it takes time to reach them. Therefore, the cost is somewhat increased over what it would be if we didn't go that far. I think that in our case a man who is able to average to clean 40 lamps a day is doing excellent work. They start in at 8 o'clock in the morning and work until lighting time. Of course, that means longer hours in the summer than it does in the winter. Mr. Ware asked how the mantle dust was sold. We have tried it in different ways. As near as I can get at it, it is about as broad as it is long; in other words, it is in the hands of the purchaser. If you weigh the mantle dust before you send it out, and they give you so much per pound, there is no way of telling how much there is in that dust that is good for nothing. On the other hand, if you clean it before you send it out, they may say it is not properly cleaned; so I do not see how you can do other than depend on the honesty of the concern that makes the purchases. If there is any better way I would like to know about it. I think I answered Mr. Nute's question, "Do the costs include special maintenance?" Our costs do include the special maintenance. Mr. Nute touched on the point of the number of the lamps in his town being maintained by the consumers. In our city we have at least two very large manufacturing concerns who are using a number of gas arcs, and are increasing the number yearly. These companies prefer to take care of their own lamps; they don't want the Gas Company men, or anyone else, in the different departments where the lighting is used—in fact, they won't have them—so that we take pains to instruct the factory men on how the work shall be done. We recently sent a man familiar with maintenance work to one of the factories, and he was there all day. Mr. Nute referred to the maintenance of lamps in houses, and Mr. Crafts also touched on this point. I think, as I said before, it is most important that the lamps be maintained. The Secretary asked if our men clean all the glassware. They are supposed to clean all the glassware, and I think they do it; if they do not, the exceptions are very few. Some one asked if our Company sent a

ladder with the men or supply a vehicle. We do not do either. We endeavor to make it clear when the maintenance contract is made that the consumer will have to furnish the ladder, or some means to reach the lamp. As stated in my paper, in New Haven we sell the lamps outright; the consumers own the lamps. There are other towns and cities where they do not. Of course, it is a question which would have to be determined locally, as to the best method to pursue. I believe I have covered all the questions, but if there are any further questions I will do my best to answer them.

The Secretary—I would move a vote of thanks to Mr. Burr for complying with the Secretary's request to furnish this paper. I think the length of time which has been devoted to it shows that it has filled a want. The subject is one which I think we are up against very strongly. I, therefore, ask you to give Mr. Burr a hearty vote of thanks. [Adopted.]

The President—Mr. Burr, I am pleased to convey to you the thanks of the Association. We will now take up the paper on

MANAGEMENT OF WATER GAS GENERATORS,

by Dr. John F. Wing, of Everett, Mass.

The new water gas works at Everett have excited considerable interest among the members of this Association. One reason for this interest is that they are new, built on unoccupied ground, on an original plan for convenience and efficiency of operation, embodying progressive and economical apparatus—not built, as is so often the case, by amplifying some ancient and outgrown plant.

The works are compact enough for convenience, and are laid out so that all departments may be enlarged. The one branch which is not compact is the purifying house, which is a mirror of progress, both for its size and its equipment. The nucleus of the plant consisted of the holder and the fuel supply. The fuel supply is the run-of-oven coke from the Otto-Hoffman ovens at Everett.

The works have been run recently to their full capacity, and it was found that the only apparatus that proved inadequate was the station meters. So in that respect they are unbalanced.

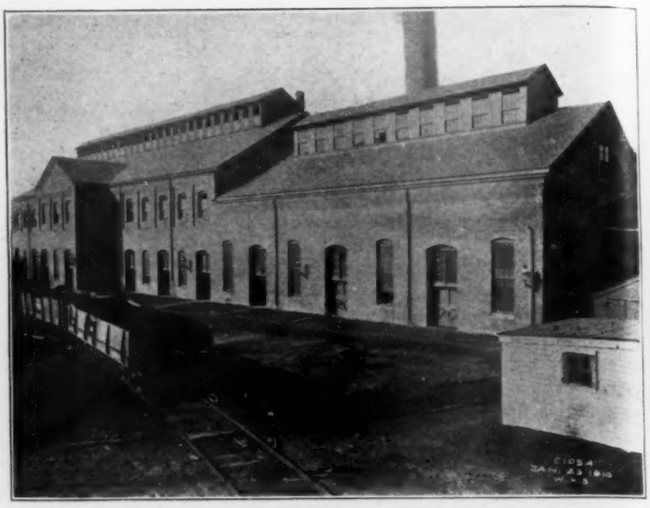
The gas making apparatus is composed of seven 10½-foot standard Lowe generators, with 15-inch linings, giving an 8-foot fire pot, or 50 square fee of grate surface, with the usual carburettors. The superheaters are equipped with electric pyrometers, 5 feet from the bottom. The fixing chambers contain about 13,500 firebricks.

The generator has 3 ashpit doors at the floor, and 6 cleaning doors 3½ feet above the floor, each 16½ inches high. The grate bars have been bent lately to slope towards the doors, and lie directly on the door frames, the ends notched and kept from springing up by a cross-bar bolted to the door frame. We thus gain the greatest possible working opening. The grate bars are seldom taken out for rebending after a run of two or three months. Without the crossbars they spring up quickly.

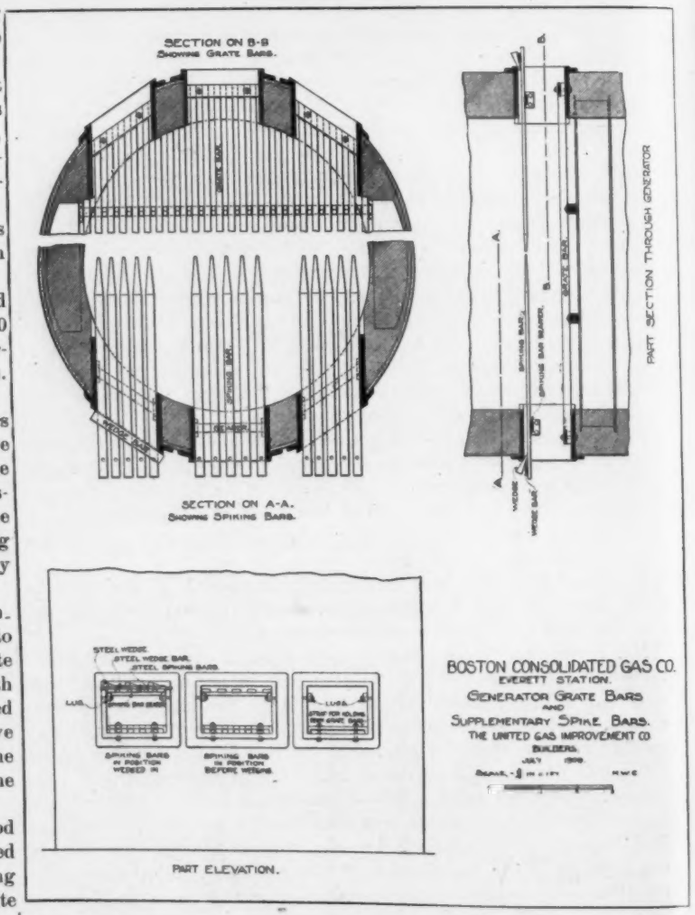
The fuel used in these generators yields ash and clinker which cannot be cleaned out in the usual manner by hoeing and raking into the bottom of the body of fuel. Some runs down through the grate and forms nodules, but most of it makes large, flat clinkers with included coke over the whole area of the grate, at the worst, sintered together and glassy. Practically the whole body of fuel would have to be drawn to clean the grate. The builders of the sets started the operation of the generators, and, while realizing the troublesome nature of the fuel, undertook to run them at their rated capacity.

This they were unable to accomplish by any variation in the method of running, being balked by the difficult cleaning, until they resorted to the device of using supplementary bars in tops of the 6 cleaning doors, which hold up the fuel so the stokers can clean the whole grate surface conveniently and quickly. The bars leave a free space under them, in the doors, 10 inches high, and the intervals of cleaning are fixed so that the accumulated clinker is not too thick to slide out under them without splitting. Very little fuel runs out. We clean, at 5-hour intervals, the grate and ash pit, the gas making being interrupted 15 to 20 minutes, or less than 1½ hours in 24 hours. The cleaning is done without burning down the bed of fuel. As soon as the last run comes off the gas maker coals up, then goes to help finish the cleaning.

When this fuel is blown up at a moderate rate, or steam is used freely, the clinker has a great tendency to stick to the walls and scaffold out sometimes for 30 inches, which, of course, is very laborious to cut off. Under such conditions we would make 12,000 feet in the 5-minute run, using down steam for 1½ minutes in the middle of the run. The 10 per cent. ash in the coke has a high iron content and is of the right composition to form an easily fusible monosilicate, and



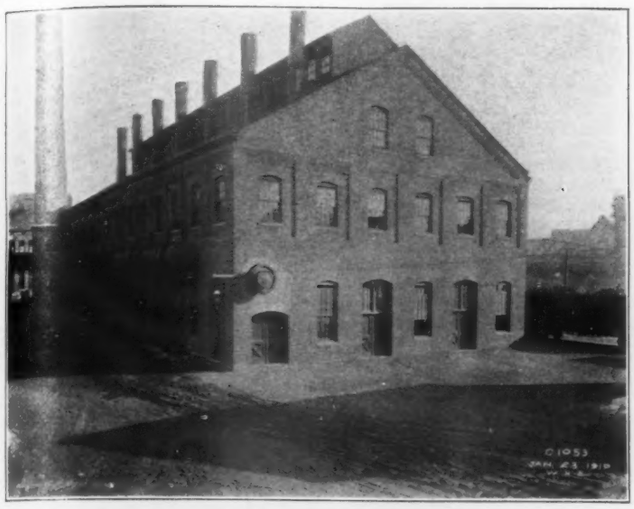
Front of Generator House.



is very sticky on the wall. We made some ineffectual experiments in spreading sand to the amount of 1 per cent. of the coke around the wall; also in trying lime.

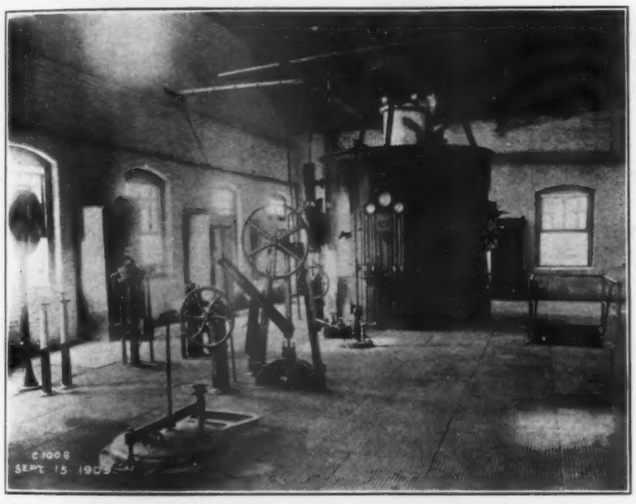
A study of the composition of the clinker shows it to be more fusible than the higher silicate derived in copper smelting, which is handled at about 2,550° F., and less fusible than some ferrous silicates which melt as low as 2,000° F. These temperatures suggest a radical change from the conventional method of operation.

To prevent this clinker developing on the wall we ran the generator harder. Increasing the blast pressure 33 per cent. raised the make per run to 14,000 cubic feet, which happens to be the theoretical effect, and what was not less satisfactory, caused all the clinker to run down to the grate, to be raked out at each cleaning. We never bar down a generator after it is put in service, as long as it runs—30, 60 or 90 days. When the fire is finally drawn the wall is smooth.

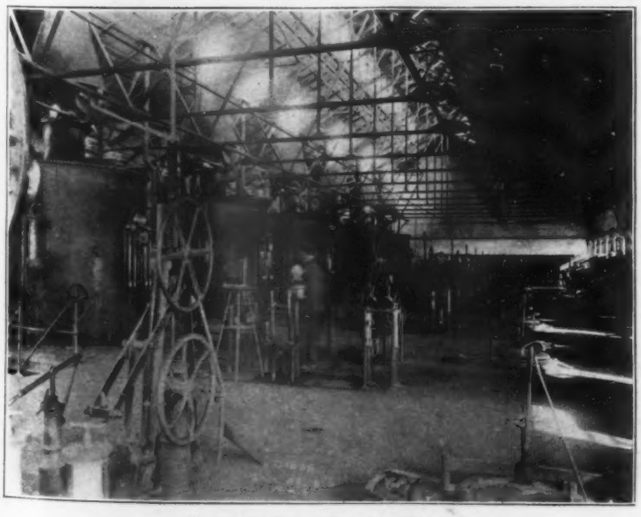


Rear of Generator House, Showing 42-Inch Gas Main.

Generator House—Spiking Bars.



Generator House: Operating Floor.



Generator House—Operating Floor.

The lining is, of course, gradually wasted, but more evenly than from slicing off clinkers daily or oftener.

We have used coke with ash of different compositions; then we vary the steaming. For more fusible clinker, such as that from unwashed Cape Breton coal, we make a shorter down run, say 1½ minutes in each run, which involves more steaming from the bottom. For less fusible clinker, a longer time on the down run, and the use of only so much up steam as will keep the grate from becoming hot and take the heat out of the bottom of the fuel, will bring the clinker down and spread it over the grate, from which it can be removed conveniently when using the supplementary bars. In handling a coke of this nature we have made down runs for 3 minutes out of 5 right along, and the same amount of steam per minute for the up run as for the down run, with no bad effects on the grate bars. An inspection of the generator wall above the doors at each cleaning will show if any variation in running is necessary. The 5-hour cleanings have this advantage. The most fusible clinker mentioned above contained 41 per cent. ferrous oxide; the least fusible 11 per cent.

There seems to be no harmful effects from this harder driving of the generators. The intense combustion is balanced by the steam. The swift flow of larger volume of air through a 10-foot bed of coarse fuel during a 3-minute blow makes a leaner producer gas—not too much to heat the fixing chambers, which are controlled by pyrometers. The heats can be raised or lowered quickly, and the pyrometers give very great satisfaction. The advantages appear from every point of view. The stokers are relieved of the most exhausting part of their work.

The combination of supplementary bars and melting down the clinker removes some restrictions in the quality of the fuel. What was formerly difficult or wholly impracticable is now used week after week. This widens our choice of gas coals where the coke is destined to be used for water gas, instead of confining us to those which are good in all respects as to gas making, sulphur and clinker. The machine is pushed nearer its physical and economical limit, as it should be, still using the same number of men, although they are rather busier supplying the coke. There is less deadwood in the generator when it is cleaned frequently.

Our monthly averages of the daily make to a generator of 21-candle power gas, corrected for temperature, have been 2,150 to 2,200 thousand, and some days while running 6 generators over 2,300. This is about 45,000 per square foot of generator. These results in a new plant, with apparatus unfamiliar to everybody, are due to the effectual work the builders did in starting it up, and the interest and active work of the whole force in running it. We make 3-minute blows and 5-minute runs, with down steam in the middle of every run, except the last two before a cleaning, from 1½ to 3 minutes, as conditions demand. We have tried different periods of blowing and steaming, and when the conditions are adjusted we get the same results, but the gas makers prefer the shorter periods, 3 and 5, because they can keep the heats steadier, as it is easier to balance the blast and steam.

The repairs to the stokeholes are only casual. When we had to bar down the tops of the sleeves got broken off. We have renewed none of them in the 15 months of operation, but use a cast iron bridge, which is sometimes renewed when the lining is repaired.

The lining has to be repaired in 30 to 40 days when using coke with the most fusible clinker, and in 50 to 70 days when using other coke. In the earlier, lighter running, they were repaired after 85 to 100 days of service. But the extra cost is compensated by the higher duty. The total expense in the last 6 months in the generator house for renewals, tools, additions and changes, including preparing for

the winter campaign, was $2.97 per million cubic feet of gas made. The manufacturing results obtained with a large make to a generator show no extravagance of fuel.

During the last 3 days of December, running a little less than 6 sets, the gas made was	41,651 M.
Make per generator per day	2,330 M.
Coke in generators per M	33.5 lbs.
Oil per M	3.75 gal.
Candle power	20 51
Candle power per gallon	5.42

Discussion.

The President—This paper is now open for discussion, and I would be glad to hear from any of you on it. I will call upon Mr. Prichard.

Mr. Prichard—I don't know, Mr. President, that I can contribute anything to the discussion. We haven't any such improved apparatus, we only have the usual sets without the steam and air meters, and we have no results which I could give to compare with Dr. Wing's. When we are running the sets, as we ordinarily run them, I think our results are a trifle better than he has quoted, although I have no doubt that the Doctor can give us better returns if he chooses, when they are chosen for good results rather than large amounts of make.

The President—Mr. Kennedy, we would like to hear from you.

Mr. Kennedy—I don't know that I have anything to say. Mr. Haddock, who has charge of our water gas plant, is better posted about it than I am. I want to say that, judging from the number of new devices which are apparently incorporated in this plant, I personally know it would pay anybody to change their generators somewhat and go to the spike bar system, the system Mr. Glasgow adopted 10 years ago. I don't want to rob anybody of his thunder, but I want to give my old boss the credit due him.

Mr. Haddock—Our average for the six months, up to January 1st, was: Candles per gallon, 5.92; coke, 34.2 lbs. per 1,000 cu. ft. We were not running 24 hours, but averaged for the six months about 700,000 feet made in 24 hours. Of course, we have to shut down parts of each day, although sometimes we run 24 hours. The make on a set figured about 51,000 feet per running hour, and that gave us about 1,100,000 feet for a 24 hours' run, using 2 hours for cleaning.

Mr. Norcross—I have often thought that the question of clinkering in water gas generators was generally neglected. Taking off 2 hours a day, which I think most of us have done, from the running time, means 8¼ per cent. of the capacity of a set, and necessitates increased capital expenditure for capacity. When one considers also the wages of the employees in that long clinkering period, and the amount of fuel which is practically thrown away in withdrawing most of the contents of the generator on these excessively hard clinkerings, it must be apparent that the matter is one worthy of careful personal study on the part of the men in charge of gas works. I think the only reason it has not received the attention that it deserves is the fact that it is disagreeable. It is the hardest thing for the gas maker, does more to wear him out than the rest of his day's work, and the engineer of the plant usually keeps away during clinkering. [Laughter.] I have seen water gas generators, with doors 14-inch high, run until the bed of clinkers in the generator was 18 inches high, and then the question came whether they should keep on with the bars or send for dynamite to get the clinker out. It is perfectly feasible to so regulate the blasts and down run as to bring the clinker entirely onto the grate bars, and it is easy to arrange the cleaning period so that the layer of clinker will be thin enough to slide easily out of the openings available.

Mr. Wheeler—Mr. President, may I have the privilege of making a few remarks?

The President—We should be glad to hear from you.

Mr. Wheeler—I visited Dr. Wing's plant last July, and found him very busy extracting doughnuts from his clinker doors, fully as large as those that Mr. Norcross has just mentioned. Since that time the Doctor has applied the principles of thermo-chemistry to the study of his generators, and I must say that in my opinion the results he has obtained are due more to the use of those principles than to any devices which he has in his plant. The principal point in his paper, as it strikes me, is this: He has correctly reasoned out the analogy betwen copper smelting and the water gas generator, and has studied out the silicates and the fluxes which occur in a generator. Now, to make his point clear, I want to explain to you what happens in a copper smelter. The ore, the fuel and the flux, duly proportioned according to chemical principles, are fed into the blast furnace, a high blast is put on, the fuel is united, consumed, the flux takes place, the clinker flows out in a fluid and every effort is made on the part of the copper smelter to keep that clinker fluid free from uniting with anything else and from carrying away any of the valuable copper. When that clinker flows out of his furnace he puts upon it cold water, or waste steam, and immediately it is disintegrated into sand. It is an instantaneous process. Now, what happens in a water gas generator? You have the same zone of temperature, almost the same blast, you have the same combustion, the same action, the same constituents, and you make the same slag that you do in a copper smelter; but there is this significant difference: In the water gas generator, instead of putting our cold water on the slag after it gets out from the furnace, we put steam under the grate bars and disintegrate it in the furnace. When I was up there in Everett I picked up some pieces of coal and coke and slag and the ash and put them in my overcoat pocket and I had it analyzed. I made up a report which I submitted to two different companies with which I happen to be connected as consulting engineer, and my report was along the lines of Dr. Wing's paper. He has discovered, and I discovered also, in his ash, that he has a mono-silicate, approximately mono-silicate, and he has so adjusted his blast, so adjusted his steam, which is the reverse of putting water on his slag outside, that he has disintegrated his slag in his generator, as he should do. If any gas man applies the principles of common chemistry and common analysis to his fuel and his ashes he will save labor, make more gas with less material and a great deal more comfort, and the superintendent will be very glad to stand around and see the clinkering done. When I started to come here, and I came almost expressly to hear this paper and to make some remarks on it, I had along with me my report which I made for the company—not Dr. Wing's company—but, unfortunately, when I was looking it over on the car, it slipped under the berth on the car seat, and I lost it. However, if Dr. Wing and the Secretary would like to have a copy of it, when I return to my office I will see that they get a copy, and I assure you that the entire chemistry of what takes place in Dr. Wing's generator, or in any other generator, no matter what kind of fuel you use, is tabulated and arranged for all parts of the country and for all kinds of coke, so that at a glance the manager can see what is the matter with his generator. [Applause.]

(To be Continued.)

[Continued from Page 685.]

REPORT OF PROCEEDINGS, FOURTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

Held in the Hall of Elks, Detroit, Mich., October 20, 21 and 22, 1909.

Morning Session, October 21st, 1909.—Commercial Section.

Discussion on the Cohn paper.

The Chairman—You have heard the paper and I hope you will give it a full discussion.

Mr. Pettes—I fully agree with Mr. Cohn on his ideas in regard to treating the public. I think we ought to be particularly careful in selecting the men for what we call the complaint department. We should not only have men who are polite, but we ought to have sympathetic men, men with whom the people will feel at home, to whom they will be glad to tell their troubles and receive attention, and when they go away they will feel that they have been treated right and their troubles sympathetically heard. Take it home to yourself: Suppose you buy a ticket at a railroad office and the man is grouchy, and when you ask him what time the train goes he tells you 1:15 right off the reel, nothing more. The next one you go to makes you feel at home. He tells you not only when the train goes, but he tries to be of service to you. I had just such an experience this morning. Such courtesy and attention put the company in good standing with the community. There are men of that kind you feel at home with, and they are the ones we should select. They are not picked up every day, but what we are responsible for is to get the right man in the right place.

Mr. Von Maur—I am particularly interested in this complaint man. He has to be a great deal more than simply courteous. The man who has to take care of complaints, which happens to be my job in St. Louis, is very much handicapped by the manner in which the complaints are received. For instance, a man comes in wanting a service run, who is apparently in a great hurry. The complaint man marks the order rush, and we spend a whole lot of money in filling it, and when we get there possibly the house is not half finished. A complaint of a leak is made. Everyone knows what is done in case of a leak. Everything else is dropped. Now, by simply talking with that customer a little and asking him, "Where is the leak? Have you noticed it for a long time? Has it increased?" etc. It may develop that it is simply a slight odor in the dining room, and he has been troubled with it ever since he has been in the house. Sometimes a complaint comes in the middle of the night, or right at quitting time, and sometimes we are compelled to send a man a great many miles to attend to it, and you can very well see the importance of a complaint man being something more than simply courteous; he must be intelligent.

Mr. Hanlon—I would like to note an example of the true spirit of commercialism on the part of the solicitor—I do not like the term canvassing. I happened to be out with one of our representatives in a small town. He had worked faithfully all day; it was coming on late in the afternoon and we were going home. A party had a gas range in use—it happened to be early in the spring of the year when business was hard to get, and, meeting this lady, she said: I think my range has about given out and I will have to get a new one. I

may as well give you the order. The man looked the range over and saw it was still a good one. The temptation was strong to take the order. He had not had an order that day. But he said to the woman: "You don't have to get a new range; that one is in good shape and can be regulated; it won't cost you anything either." There was an example of true commercialism. She said, "That is very good of you. I was going to get a new range; but I will take a hot water heater anyway; I really wanted both." It seemed after that his luck changed, for he went down the street and sold two more ranges.

Mr. Linton—In connection with this paper, I want to speak of our methods. In small places the solicitor and the inspector are one and the same. We have found it a very good idea in meeting with electric competition to combine the solicitor and inspector. That is, a man who is capable of selling goods, but who primarily enters the home as an inspector of appliances. A day or two in advance of his going to a house he sends a card advising the people that at a certain time he will call to make an inspection of all the lights and appliances, and will put all those lights and appliances in good condition. He generally finds that some of the lights or appliances are not giving satisfaction, and by putting on new burners, mantles or tips, or making some adjustments, he gets the goodwill of the people. They find it costs them nothing, and while he is doing this work he makes a note of the appliances needed in the future, and if he does not sell at once he has a good record for future reference. We find that works very sucessfully in a small place, and I imagine it would be equally successful in the larger places.

Mr. Jones—I think everybody knows that for a gas company one of the best assets is the goodwill of the public; and the incident Mr. Hanlon related of one solicitor having lost a sale by telling the woman she did not need a new stove, is one of the best policies that possibly can be adopted. If all gas companies would adopt the policy of showing their customers what was the most economical appliance for their use; for example, if the solicitor should find an appliance that is using more gas than is necessary to get good results, and should tell that consumer he would make a trade with him by giving him some appliance that would use less gas - even if he had to take out a second-hand appliance and put in a new one—he would make a good friend, and show that customer that the gas company was striving to work in every way for his interest. Most up-to-date companies do that now. Another thing that some gas companies do and that some do not, is the returning of money for overread meters. That is a thing that I have found again and again gets the goodwill of the public more than any one other thing. If the customer's meter is overread 1,000 feet or 10,000 feet, as soon as the office find it out, if they will return the money, or return the customer's check for it, he will immediately say the gas company has given him the square deal; he is not waiting for my meter to catch up, and he is not keeping me out of my money. I know some gas companies that do not return money for overread meters, but they are not up-to-date ones. The most successful department stores are those run on the liberal plan of letting the consumer who buys the goods, take them home, and if not satisfactory return them, and not haggle over it. All you have to do is to return the goods and get your money back. The gas company should do the same thing, and the sooner it is realized that the gas company has to do business on the plan of a department store, or any other kind of business, the greater and more speedy will be their success. It is their business to please the public, and the more you please the public the more your business will prosper.

Mr. Gaston—It has long been my belief that, in order to increase the sale of appliances, and increase the sale of gas as well, every customer should be familiar with the meter. He should know how the meter is constructed and how to read it. We have made a practice of distributing cards giving full explanation as to meters, and also of impressing upon every customer the fact that we are anxious to have them visit our testing room, and we have made quite a success of it. Another plan we follow, which is not, however, new, is to teach the school children how to read meters, and meters of all character, whether gas, electric or water. You find meters in almost every home, of some description, and the children easily learn how to read them. I took the matter up with our board of education and met with some opposition. I then went to the Superintendent of Schools, who said it looked too much like commercialism, and that he was not there to help any particular business. I told him I thought he was there to help all business, and that I thought it was his duty to teach the children to read meters; but that it was not his duty to provide the means. We would do that free of charge. At an expense of about $150 we put in the hands of the 5,000 school children in our town cards with very simple instructions how to read meters. We also furnished each teacher with a mounted dial. I personally took it upon myself to get teachers to instruct the children how to read the meters. It turned out that only about 4 out of every 60 teachers knew how to read gas meters, and the result has been that a great many of the parents are now reading the meters, who knew nothing about it before. We also impress upon our representatives the necessity of estimating the consumption of each burner, and to let the customer know approximately just how much gas is being consumed per hour. The result is that we now have very few complaints.

The Chairman—A paper dealing with a specialty is discussed better before an audience composed of men interested in that specialty than when it is discussed before an audience composed of a large percentage of men who care nothing about that specialty. For the last 3 years the question has been up before the Directors as to the division of the meetings of this Institute into sections, each dealing with specialties. You can readily realize that a paper dealing with water gas or coal gas, their chemistry, or purification, or distribution, or construction, or any one of a dozen other subjects I could mention, would attract a body of men just as much interested in those particular subjects as you men are interested in the commercial side of the gas industry. It seems to me this meeting to day points the way toward making a greater success of the meetings of the Institute.

Mr. Fitzgerald—I would like to move that it is the sense of this meeting that the discussion of special topics by those specially interested in them is extremely desirable and profitable. [Applause.]

The resolution was seconded and unanimously adopted by a rising vote.

The Chairman—At 2:30 P.M. another meeting will be held in this room for the hearing of papers on "Automatic Oiling Meters," the "Booster System at Rochester," and the "Acceptance and Interpretation of Data." After the adjournment of that meeting, all the members of the Institute will reconvene as one body in the large hall at 4 P.M.

Mr. Searle—I would like to re-open the discussion on the subject of commercialism. One point worries me. Mr. Hanlon mentioned the fact that a woman was told she did not need a new range. I do not know how old that range was, but she was evidently in the spirit to spend money and had to spend it. I think if there was any spirit of commercialism in that man he would have sold her an up to-date cabinet range and sold the heater to some one that needed it more than she did. I would not have missed the opportunity to put a new range in that house. It is on the same principle that we are stopping at the Pontchartrain when we could get accommodations for 75 cents a day.

Mr. Hanlon—I do not want to let Mr. Searle get a wrong idea of this matter. This lady did not want to get a cabinet range, and she did not want to spend more money to get the elevated type of range. We felt that the range she was using was ample for her purpose. She had a large family; and I think that as long as the appliance could be put in first-class condition, and would give her satisfaction, that our man was justified in advising her as he did. If she wants to get another type of range, all well and good; that man can go back there later, when that range cannot be used and sell her the elevated type. Our men have sold many of the elevated type of range, perhaps as many of that type as any one of the large organizations. They are right after the business. Possibly the man was wrong, but the question was put up to him, and he acted according to his best judgment. He sold the woman a water heater anyway.

Mr. Clabaugh—I want to say I think the man did absolutely right. He was honest, and we all know that honesty is the best policy. When a man finds a range in a fairly good condition, that can be fixed up with a little adjustment or by repairs, he does right in telling the consumer so. We have made a friend there. This woman may have been willing to spend the money, but she did not have to, she saved her money; she tells her neighbor of it, that neighbor tells another, and that solicitor has made friends with the entire locality.

Mr. Searle—As far as Mr. Clabaugh's atttitude is concerned, it is absolutely honest. There is no doubt about it, but we do not know the conditions in the case, and we are dealing with an unknown quantity. To-day the public demands service, and that is what we are selling. A certain amount of fair commercialism could have convinced that woman, and honestly, that her range was a back number, and that a modern, up-to-date range, a cabinet range for instance, would do her work easier and better—I will not say better, but a little more comfortably—and the man with the proper spirit of commercialism would have sold her an up-to-date range, and would also probably have sold that second range to some woman down further on the same street.

Mr. Eavenson—What would be your idea in selling that second hand range to somebody else, if it was not good enough for her?

Mr. Searle—Simply because many people cannot afford to buy a cabinet range; they have to work with some discomfort; they have to ride in the smoker, or the second-class compartment, by force of necessity. Now, just as soon as that person can afford it, she will buy the cabinet type of range. We are selling lots of second-hand stoves to people who cannot at present buy a cabinet. I do not want people to think that simply because that woman has a range she is being served to the best advantage. I would not take the average 16-inch oven range if you gave it to me. I would rather pay $60 for a modern, up-to-date range, and the same holds good in every household. The solicitor must analyze every case very carefully in order to take proper care of it. He should exchange the maximum amount of service for the maximum amount of income. Now, as to teaching the people to read meters, as was referred to by Mr. Gaston; there again you are selling service. We make no attempt to reduce complaints—we try to convince the consumer that he is getting good service, and show him that by reading the meter daily he is able to keep daily track of the gas consumed. I would not, however, impose upon a small consumer by selling him a cabinet range, but I would sell him a new and better range if I thought it would be to his advantage. [The meeting was adjourned to 2:30 P.M.]

Afternoon Session.

The Chairman—I will ask Mr. Walton Forstall to act as Secretary of this meeting. The first thing in order is the reading of the paper by Mr. Thomas D. Miller, of New Orleans, on

AUTOMATIC OILING METERS.

When the fifth district of New Orleans, known as Algiers, had gas turned into its mains from a high pressure pipe laid under the Mississippi river, in the fall of 1902, it was decided to install exclusively wet meters, there being several thousand wet meters still in use in the city. It very shortly developed that these wet meters, in order to keep the gas supply on, had to be filled with annoying frequency, some of the larger consumers requiring attention 2 or 3 times each week. This was due undoubtedly to the extremely dry gas, as a result of compression to 30 odd pounds, and consequent absorption of water from the meter while passing through it.

In the spring of the following year a wholesale exchange of meters was made and nothing but dry meters installed. During the winter of 1903-4 there was discovered an unaccountable falling off in the registration of most of the meters in Algiers. An examination of the meters showed that the leathers had all of the oil extracted from them, and that sufficient gas would actually pass through the pores of the leather to maintain one or two common burners. Examination showed these leathers to be in excellent condition, excepting that there was no oil whatever in them. Means of oiling the leather from the inside were devised, which proved quite satisfactory. Neatsfoot oil, heated to 110° F., was used with some lampblack in it; the back plate was removed and oil placed in the inside of the leathers through the ports; the ports were then closed and the meter thoroughly agitated. After giving ample time for the leathers to become saturated the oil was allowed to drain out through these ports as best it would, and what surplus oil remained filtered through the leathers and made dipping meters.

The ordinary oiled diaphragm will, of course, perform its prescribed duties and act in every respect in a thoroughly efficient manner as long as the original oils, or substitute oils, remain on the leather, and in this way render the leather pliable, gas tight, and at the same time preserve it in its original measuring capacity. Under the action of certain kinds of gas the diaphragm oils are affected and are entirely removed from the leather without the replacement by substitute oils, producing what is generally termed bleachers.

To overcome this a number of gas companies adopted to a greater or less extent the dipping meter, which was a long step toward the preservation of the diaphragm and prolonging the life of the meter.

Experiments were made with the dipping meter, and it was found that an oil of sufficient viscosity to serve the desired purpose would only travel high enough on the leather to take care of a 60-light diaphragm. This established a limit to the size of meter to which the dipping process could be successfully applied. There were other objections and limitations.

So long as the bottom of the diaphragm is merely dipping in the oil the leathers will keep themselves in fairly good condition from capillary attraction. If, however, the oil is allowed to stand too high in the meter it will pass through the leathers and fill up the bottom of the diaphragm compartment, which, if filled to any extent by oil, would surely have effect on the whole meter and lessen the actual measuring capacity of the diaphragm.

Under certain conditions of the gas the tendency of the oil in a dipping meter is to absorb hydrocarbons rapidly, and, owing to the large area exposed, increases the height of the oil in the case. The oil ports at the bottom of the case must be opened and the surplus oil removed in order to preserve the accuracy of the meter. In order to do this these ports should be easily opened and closed to facilitate this work. With the standard form of construction of dippers, these openings can be unsoldered and resoldered while the meter is in place, but this favorable condition gives the gas thief an opportunity to puncture the leathers, punch holes in the partition or establish a by-pass which will pass as much as 40 cubic feet of gas per hour on 2 inches pressure, and from a casual glance at the meter these conditions would not be discovered.

With appreciation of some of the objections to the dipping meter, the work of devising some means of oiling the diaphragm leather from the top was begun.

Laboratory experiments were made to ascertain the character of oil best suited to the purpose.

Mineral Oils for Diaphragms.—An oil suitable for oiling diaphragms should be non-volatile, free from mineral and fatty acids, and of a degree of viscosity which will allow the oil sufficient capillary power to keep the diaphragm oiled from botton to top. Of these points the question of acids is the most essential. A pure mineral oil may contain traces of free mineral acid, as a residue from the washing and distillation. Sulphuric acid is the acid generally used (when acid is used at all) and unless the oil is thoroughly washed, traces of this acid will remain and will prove detrimental to the life of the meter.

Neither animal nor vegetable oils are permissible as meter oils on account of the liability of free, fatty acids, which are produced by decomposition of the oil. This decomposition is a more or less slow but constant reaction in these oils, hence free, fatty acids may be present and may range in quantity from 1 to 80 per cent., depending on the oil used. These free, fatty acids form basic compounds with the metal of the meter, resulting in deterioration of same. Five samples of mineral oils were secured and results of work on these oils follow:

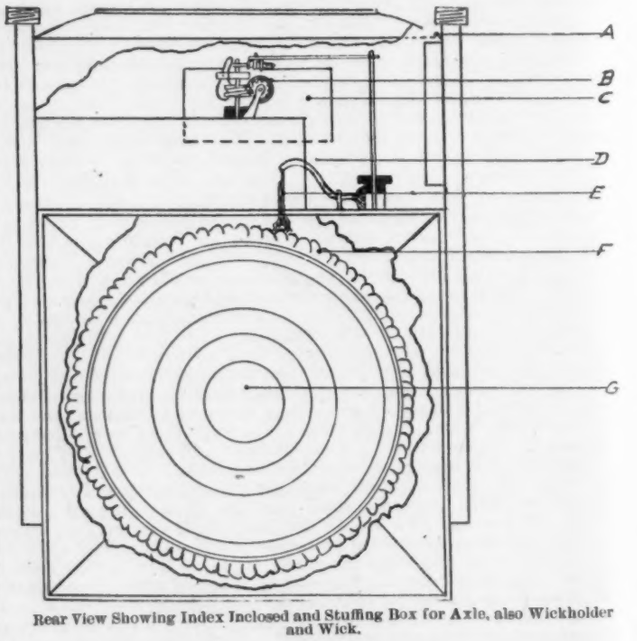
Sample.	Color.	Specific Gravity at 60° F.	Direct Baume.	Reaction Acids Fatty and Mineral.	Per Cent by Weight of Hydrocarbons Absorbed from 10 Cu. Ft. of Gas Passing over Surface of Oil at Rate of 1½ Cu. Ft. per Hour.
A.	Dark red amber.	.8978	26.0	neutral	13.69
B.	Amber.....	.8992	27.4	"	17.80
C.	Amber.....	.8993	25.7	"	16.63
D.	Amber.....	.8478	35.2	"	17.06
E.	Dark amber.....	.9148	23.0	"	16.38

For capillary power, ½ inch strips of meter leather were suspended free in oil and the rise of oil timed.

Rise in Inches.	A. Min.	A. Sec.	B. Min.	B. Sec.	C. Min.	C. Sec.	D. Min.	D. Sec.	E. Min.
¼....	6	30	3	30	13	30	4	..	15
½....	13	40	9	..	38	..	9	10	40
1	28	30	17	30	69	..	15	20	79
1¼...	50	..	29	..	107	..	25	.	135
1½...	80	..	48	..	150	..	35	..	180
Inches in 48 Hours.									
	6½		7½		5½		Beyond 10		4½

B sample of oil was selected as having sufficient viscosity and the greastest diffusive quality. Bits of leather were dipped in various grades of oil and suspended in a box exposed to the atmosphere of our meter shop for many months. The leathers still show satisfactory pliability and strength and the presence of oil almost to saturation. No evidences whatever of the quantity of oil having become reduced by contact with the atmosphere in rather a high temperature and no hardening or stiffening of the leather can be observed.

Autoiler.—In the development of the autoiler, separate chambers



Rear View Showing Index Inclosed and Stuffing Box for Axle, also Wickholder and Wick.

INDEX.

A.	Oil tube to table.
B.	Axle stuffing box.
C.	Index enclosure.
D.	Wick.
E.	Wickholder.
F.	Diaphragm.
G.	Disk.
H.	

for the oil were tried, and finally the top, or gallery, of the meter was utilized. This, of course, necessitated the inclosing of the meter dial in an oil-tight box so as to prevent the dial from becoming stained by the oil. The presence of oil in the gallery has beneficial effects. It keeps all the journals and the worm gear of the working parts of the meter oiled. It keeps the stuffing box of the flag arms thoroughly moistened with oil so that we have never had a leaky stuffing box from an autoiler.

The pressure of oil in the gallery as well as in the gas chamber has a decided tendency to keep up the lubrication of the working parts of the meter, thereby causing it to operate with less loss of power. The oil vapor carried by the gas up through the valves is sufficient to keep the valves oiled slightly so that there is no such thing as squeaking valves on any of the meters, even on the "A" and "B" type with the large heavy valves. No such thing as a cocked valve has been discovered in the autoiler, while we have frequently found such where the installation was of the standard type.

The oil is supplied to the diaphragm leather through a tube which passes just through the bottom of the gallery and extends up above the bottom of the gallery about the height of the back plate. A wick is strung in this tube with compression sufficient to make the flow of oil a desired quantity, this wick extending below the bottom of the tube with its ends frayed so as to come in contact with the top of the leather. The wick drops down into the oil, where it is secured to the bottom of the oil chamber, and the capillary action takes the oil up over the top of the tube, and the capillary action and gravitation carry it on down through the tube to the end of the wick, where it deposits on the leather. This action will be more rapid when the leather is dry than when it is saturated with oil, and with proper compression on the wick can be made to supply the oil so that it will completely oil the leather of the diaphragm in 3 or 4 months, thus insuring the fresh oiling of the entire leathers 3 or 4 times each year.

The pinion shaft, from worm to the dial, passing through the dial box has a stuffing box which does not require to be tightly stuffed, only sufficient to prevent oil from passing through, and then only such oil as may splash on the stuffing box in handling the meter. I believe, so far as the safety of the meter goes from tampering, it has all the protection an ordinary meter affords.

There is no possibility of gas by-passing from one side of the partition to the other, through the oiling device, if the wicks are properly strung. An effort was made to accomplish this without the wicks being oiled, but no appreciable quantity of gas could be gotten through. With the wicks under proper pressure, and no gas passing without any oil in the wick, it is self-evident that when they became saturated no gas would pass.

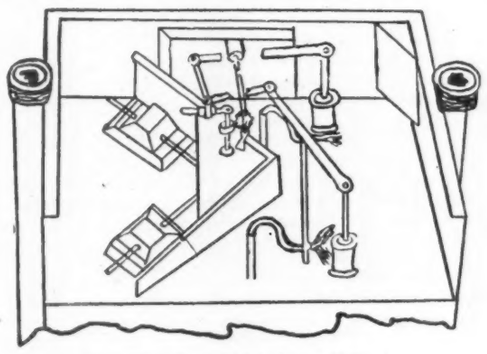
The oil for the autoiler should be inserted through a small hole in the corner of the top, and a syringe of proper capacity will serve not only to place the oil there but measure it at the same time. If the space about this hole is properly guarded by a very simple device the possibility of successfully tampering with the meter is eliminated. The hole should be closed with a small rivet and drop of solder.

The first autoiler that was made and put into service was placed in the meter shop. The leathers in this meter were installed perfectly dry and a glass side placed in the meter. The oil chamber was given a dose of oil and the meter placed in service. In 36 days the leathers were completely oiled and the meter then tested and adjusted. This meter has now registered over 700,000 cubic feet of gas and the leathers are apparently in as good condition to-day as when they were first installed. The accuracy of the meter is phenomenal in that every test it shows within a very small fraction of 1 per cent. the same degree of accuracy as when it was first started.

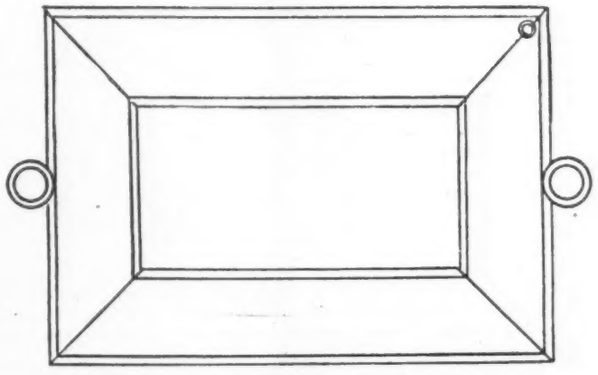
In our first experiment the meter oiled its leather in entirely too short a time, as no idea at that time had been formed as to how tight the wicking should be packed in the tube; but recent standard tubes and wicking, by experiment, show a perfectly dry diaphragm will become completely oiled in 36 days, and there is no doubt but that the flow of oil is more rapid and the capillary attraction more active on account of the leather being dry than it is after the leather became practically impregnated.

The autoiling meters it would appear can be given a dose of oil sufficient to keep the leathers oiled for from 2 to 5 years, thus not requiring constant attention removing surplus oil, shaking up, replacing oil, etc.

The autoiler may be handled in any manner, turned upside down, placed or the side, etc., without any danger, either in throwing oil on meter valves or in placing too much oil at one time on the meter leather, provided the feed on the automatic oiler is properly regulated.



Rear View, Showing Interior of Gallery.



Top View.

It would, therefore, appear as though this method were ideal in taking care of meter leathers, as proper regulation would give a certain predetermined constant feed of the oil, at the point where it will do the most good, that is, directly at the top of the diaphragm.

Results with Autoilers.—Fifty-three autoiler meters that had been in service from 18 months for a few and 6 months for the larger portion were brought in and tested. When put into service

	Per Cent.
18 were fast an average of	.94
27 were slow an average of	.89
8 were exactly correct, all as per prover records.	

Upon return to the shop for test, removals having been made for specific purpose, none having come in for defects of any character, showed

	Per cent.
27 were fast an average of	1.23
14 were slow an average of	1.30
12 were exactly correct, all as per prover records.	

The maximum error of meters going out was 2 per cent. fast and 1.98 per cent. slow; the maximum error of meters coming in was 5.26 per cent. fast and 2.44 per cent. slow; the average error of all the meters going out was .127 per cent. slow; the average error of all the meters coming in was .486 per cent. fast.

The aggergate consumption on the 53 meters was 3,042,200 cubic feet, an average of 57,400 cubic feet per meter, with a maximum consumption on any one meter of 684,800 cubic feet which meter tested 1.43 per cent. different from its test when set. The minimum consumption on any one meter was 6,000 cubic feet.

Eight months ago there were installed in the city approximately 600 autoilers. The 53 meters described are all the autoilers handed into the shop since May 1st of this year.

Discussion.

The Chairman—This is a paper in which every gas man in the United States is interested. We have to have meters, have to keep them accurate, and have to keep the diaphragms in order. If any members wish to add anything, or to dispute anything, we shall be glad to hear from them.

Mr. Hardick—Several years ago we started in with the dipping meters. That is, we punched a hole on the bottom, on each side of the diaphragm, and there inserted our oil. On removing the meters for testing we found them in very good condition, in fact, the leathers were in about the same condition as when installed. Now, as to the self-oiling meters, upon which this discussion is based, I think we have some 12 of them installed, which have been out practically 18 months and have not been removed. I wish someone who has had experience would give us a little information as to how long the oil

will last in the top of the meter; also, what means they have for refilling the meter without removing it to the shop. Of course, you can take a soldering iron and unsolder the meter at the top, but there is danger in that. A few more year's experience will tell us the result of this practice, as it is only in its infancy at the present time. I would like to hear from some one who has had experience with dipping meters or self-oiling meters of more than 2 years; I think we would all be interested in them.

Mr. W. A. Castor—The dipping of meters has been practiced in Philadelphia for the past 4 years, there now being more than 200,000 meters of this class in use in that city. The oil is introduced direct into the diaphragm chambers and picked up by the diaphragms as a result of the capillarity of the leather. One objectionable feature that appears in connection with this practice is the tendency of the light mineral oil to penetrate the seams and corners at the bottom of the meters. Extensive experiments, made to determine the largest meter that could be made dipping, with the assurance that the oil will travel to the topmost portion of the diaphragm, showed we were perfectly safe in including the 300-light meter, the oil rising faster in the diaphragms than it did in straight strips of leather, to the height of the top of a 300-light diaphragm. Our experience has shown that the presence of oil in the bottom of the meter does not tend to pull down condensation—that the condensation does not accumulate to such a depth as to affect the registration—that no tampering is done by the consumer, to the rivets soldered in the oiling holes punched in the side of the meter—that proper oil absolutely free of acid can be readily obtained, and that said oil does not become rancid with age. I cannot see where the method of putting oil into meters, as practiced by Mr. Miller, has any advantage over the scheme in general use in Philadelphia and in many other cities, but on the other hand presents to me the following objections: Expense of incasing index mechanism, of providing oiling tubes and wicking for same, presence of gas under the top of the meter, the inability to determine the rate at which the oil is conducted from the table to the diaphragms, necessitating unnecessarily frequent trips to the consumers' premises to renew the oil periodically, or else taking a chance of the oil all being carried away, leaving the diaphragms free to become bleached as soon as temperature conditions are suitable to produce bleaching, the disadvantage of removing and of resoldering the top rivet in oiling hole at consumers' premises when recharging meter; the needless use of oil in the top after the oil has reached a sufficient height in the bottom of the meter to enable the diaphragms to dip into same, thereby making the meter a true dipper.

Mr. Searle—The little things that cause annoyance or the danger of occasioned theft should not lead us to give up the dipping meter or the self-oilers. The thief will beat us now and then, no matter what precautions are taken. I do not think the rivet hole in the meter will attract the average thief. I know some of us are apt to discard a good thing—and both of these are good—because someone may steal gas. Well, I would not let a few thousand feet of gas deter me from having a few thousand meters accurate.

Mr. Rice—One very important fact is that these methods have the advantage of allowing the meter to take care of itself, which should strengthen us in our effort to get away from the idea of pulling out the meters periodically, just because we think there may be something wrong in them. We want to be strong enough in our conviction that the meters are right and able to take care of themselves, to impress it upon the legislative bodies and commissions that are formulating rules on this subject. In Wisconsin, for example, a Commission has decided that all meters must come out every 3 years. Now, we all know that a meter that has been in 3 years, and is doing good work and properly cared for, is in better condition than it was the day it was set. It is a shame to take that meter out just because somebody thinks it may be wrong. It hurts the meter to take it out. It does it much harm. Years ago, in one of the largest repair shops in the State of Wisconsin, tests showed that between 70 and 80 per cent. of all the meters removed for testing were correct within the required limits. I have no doubt the ratio maintained to-day is still higher, and if this new method brought forward by Mr. Miller will increase the life of the meter it should receive our approval. There is one feature that I did not understand. Is it a fact that the auto-oiling meter can be transported without difficulty, and can be turned upside down? I believe that is not the case with the dipping meter.

Mr. Castor—Reference has been made to the fact that meters may be turned upside down with perfect safety. We are extremely careful to impress upon our employees that they should never under any condition be turned upside down, dipping or non-dipping. We cannot safely fill our meters with oil for transportation, but when we do repair work for companies outside of Philadelphia the holes for introducing the oil are punched in the outlet side of the meter and proper rivets soldered in same. When the meters are received from the repair shop it is a simple operation to remove the rivets with a soldering iron, introduce the proper quantity of oil into each diaphragm compartment, then replace the rivets in the holes.

Mr. Rice—How can you depend on the proof of that meter if it is filled in a local shop?

Mr. Castor—A number of experiments, made to determine the change in proof of meters removed from service and of meters that have been cleaned and oiled, or new diaphragm repairs, show that the oil introduced into the diaphragm chambers does not materially alter the proof of meters that test within reasonable limits of error upon removal from service, and affects the proof of repaired meters to such a small extent as to be negligible.

Mr. Forstall—Bearing on what Mr. Rice said about sticking by your meter and the foolishness of changing them every 3 years. We have in Philadelphia followed the practice for the last 5 or 6 years of not changing the meter simply because it has been used 3 or 4 years, but if the bill for the quarter is less by more than 33 per cent. than the corresponding quarter of the year before, we make out what we call a house test card, which is sent to the shop, then the shop makes the test of that meter on a small flame. If the meter does not register on a small flame we take it out, and find as a rule it needed to be taken out. We have made about 20,000 house tests in the past year, and out of those 20,000 tests I do not believe we have brought in more than 5,000 or 6,000 meters.

Mr. Rice—That is very interesting to me, because a year ago we started in on the same idea and are now getting the system pretty well developed. The ledger clerk is going over our ledgers and comparing the bills for 2 and 3-year periods.

Mr. Castor—We are keeping a very careful record of the tests, upon removal from service, of all meters, both dipping and non-dipping. The tests are tabulated according to the number of years the meters have been in service at the last address. From this record we expect to definitely determine the maximum number of years the meters may be allowed to remain in service as reliable measuring devices.

Mr. Miller—I do not understand what Mr. Castor means by the presence of gas under the top of the meter. There is nothing of that kind, for no gas gets through that wick. That was brought out in the paper. There is no occasion to watch the meter to see if the oil remains in the top to insure accuracy. If the stringing of the wick should be so imperfect as to let that oil through in 6 months, as has been the case in some instances, you have dipping meter and we are right back where we started before we got the automatic oiler. In regard to Mr. Searle's remark that the thief is going to steal anyway, I don't mean that a man is deliberately a thief, but the opportunity often makes a thief, and the opportunity offered will often be taken, when if it was not there it could not be taken. I do not know whether my community is any different from others, but we have had a good deal of such experience. I do not know whether this auto-oiling is an ideal thing or not, but I think the advantages it offers are brought out in this paper. I had a great many of these meters that came in after having been in use for some time, registering up to 30,000, 40,000 and 50,000 feet, and found them all right. I heard Mr. Brown remark at the meeting last year one trouble he was having was that successive tests were unreliable. The successive tests produce an abnormal condition, which causes a great deal of trouble while using air. Therefore, he used gas afterwards. I have two records here where we made five successive tests, one right after the other. The first test showed .050; the second test showed nil; the third showed .050; the fourth, .050; the fifth, nil. Another one was 3 per cent. fast, the second test showed 4.17; the third showed 4.15; the fourth showed 4.17. We have tried that time-and-time again on meters, to find out if there was going to be any change from the introduction of air. The fact that the introduction of air in that meter does not change the tests is the best evidence in the world that your meter is in good condition to handle any kind of gas you may make, whether it is absorbing or giving out oil; if the oil is going out you are supplying more all the time. If the oil is coming in there, I will admit, you are going eventually to have a dipping meter, but in the dipping meter if the oil is taken out it is gone for good.

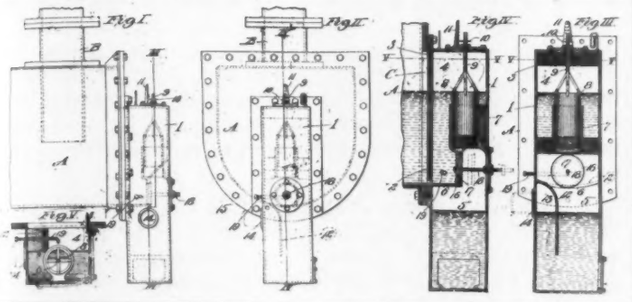
(To be Continued.)

Dell's Improved Dip Regulator and Tar Seal.

On March 2d U. S. Letters Patent (No. 951,633) were granted to Mr. John Dell, of St. Louis, Mo., for an improved combined dip regulator and tar seal, his object in this device being to construct a regulator and seal combined in a single device, the office of which is to keep the tar in the hydraulic from becoming congealed. Using the words of the specification Fig. I. is a side elevation of one end of a hydraulic main, a dip pipe leading thereinto and my combined dip regulator and tar seal. Fig. II. is an end elevation of the parts shown in Fig. I. Fig. III. is a vertical cross section taken on line III.—III., Fig. I. Fig. IV., is a vertical longitudinal section taken on line IV.—IV., Fig. II. Fig. V. is a horizontal section taken on line V.—V., Figs. III. and IV.

In the accompanying drawings: *A* designates a hydraulic main to which may be connected any desirable number of dip pipes *B*. The hydraulic main is provided with an opening *C* that, as shown (see Fig. IV.) is located in one of the heads of the main, although it may be located at any other desirable point in the main.

One designates the shell of my dip regulator and tar seal, which is connected to the hydraulic main at the location of the opening *C* therein, in the rear wall of which is a lower aperture 2 and an upper aperture 3. The shell 1 is subdivided interiorly into an upper dip regulator compartment 4 and a lower tar seal compartment 5. Direct communication from the hydraulic main to the dip regulator compartment is constantly maintained through the apertures 2 and 3, the former of which provides for the passage of liquid from the hy-



draulic main to the dip regulator compartment for the purpose of maintaining a level of liquid in said dip regulator compartment, corresponding to the level of liquid in the hydraulic main, and the aperture 3 providing for the passage of gas from the main to said compartment to maintain the same gas pressure in the compartment as is present in the main.

The tar seal compartment 5 is separated from the dip regulator compartment 4 by a partition 6 that is in part horizontally positioned and in part vertically positioned in the shell 1 and in which is incorporated a hollow gate receiving member 7.

Eight is a gate that is operable in the gate receiving member 7, and which is adapted to be raised and lowered in said member to control the passage of liquid therethrough from the dip regulator compartment 4 to the tar seal compartment 5. The gate 8, as shown in the drawings, is in the shape of a cylinder having screw-threaded engagement with the member 7, but it may be of any other desirable description. The gate is adapted to be raised and lowered by a stem 9 that extends upwardly through the top of the shell 1, and which is provided with a pointer 10 that is adapted to indicate upon an index 11 the position of the gate and consequently the height of the liquid in the hydraulic main and the compartment 4.

In the tar seal compartment 5, into which the liquid may enter from the compartment 4 by passing through the gate 8, is a diaphragm 12, see Fig. III., that extends downwardly from a point near the upper end of the compartment to a point above the bottom of the compartment. This diaphragm serves to subdivide the tar seal compartment and furnish therein an outlet chamber 13 back of the diaphragm and which is constantly separated from the main portion of said compartment by said diaphragm. Provision for the discharge of tar from the tar seal compartment is made by furnishing an outlet 14, which leads from the chamber 13 and through which the tar entering into the tar seal compartment may constantly find escape. To provide against siphonic action in the chamber 13, and any connection that may be made to the outlet 14 for the purpose of conducting the tar through said outlet, I provide an air inlet opening 15 that leads into said chamber from the exterior of the shell 1, see Fig. II., thereby avoiding liability of the tar present in the tar seal compartment being withdrawn from the compartment to a sufficient extent to break the seal therein.

It is necessary in the use of the hydraulic main to, at intervals, flush the entire amount of liquid from the main, and to provide for such flushing into the tar seal compartment of my device, I provide in the partition 6 of my device, a flushing orifice 16, see Figs. III. and IV., said orifice being normally closed by a valve or stopper 17, which preferably has screw threaded engagement with the wall of said orifice 16. The valve 17 is provided with a stem 18 loosely mounted in the wall of the shell 1, and adapted to rotate in said wall for the purpose of unseating and seating the valve. When said valve is withdrawn from the flushing orifice, the liquid in the hydraulic main is permitted to flow into the tar seal compartment 5, and after entering into said compartment, finds escape therefrom by flowing through the outlet 14.

It frequently occurs that the liquid in the hydraulic main becomes very thick and heavy and will not readily flow from the main in flushing action, and to induce or facilitate such flow, I introduce into the dip regulator compartment 4, immediately back of the flushing orifice, a steam jet pipe 19, to which a steam conducting pipe may be attached to deliver steam to the jet pipe and therefrom into and through the flushing orifice.

The combined dip regulator and tar seal herein described is, as will be seen, of simple construction and requires very slight attention to keep it in continuous operation, due to the advantageous combination and close assemblage of its various parts.

Items of Interest
FROM VARIOUS LOCALITIES.

MR. H. C. AIKEN, writing from Chester, Pa., under date of the 10th inst., says that we were in error in stating that he had "been appointed special representative with the Philadelphia Suburban Gas and Electric Company." Continuing, Mr. Aiken remarks, "As this is entirely in error, I shall thank you to put a notice in your next issue to that effect." Meanwhile it is allowable to further report that the letter from which the above extracts are taken is dated Chester, Pa., and is written on a letter head of the Eclipse Gas Stove Company, with the words "Rockford, Ills.," scratched, and with these words added: "Eastern Sales' Manager. Address Reply to Writer, at Chester, Pa."

AT the annual meeting of the Louisville (Ky.) Lighting Company (electric), the officers elected were: Directors, F. M. Sackett, W. H. Edinger, John Stites, Jas. B. Brown, D. H. Murphy, M. L. Akers, W. F. Sheehan, U. T. Brady and T. E. Murray; President, F. M. Sackett; Vice-President, W. H. Edinger; Secretary, T. B. Wilson.

THE residents of the queerly named town of Homing, Okla., have organized the Homing Gas Company, with a capital of $100,000. The City Council has granted the necessary franchise—it is to run for 20 years—and the proposition will be again voted on within a few days. The officers are: President, Chas. Welling; Vice-Presidents, P. Harris and Alfred Brown; Secretary, Charles Peters; Treasurer, H. M. Maher.

THE Board of Gas and Electric Light Commissioners has sanctioned the petition of the Springfield (Mass.) Gas Light Company for permission to add to its capital stock the number of 1,625 shares, par value $100 each, to pay off outstanding notes of the Company, and to provide for increases and additions, including the new buildings and apparatus recently constructed. The Commissioners state that the stock shall be sold at $200 a share. The Company had $325,000 in notes outstanding November 30. The new office building is stated to cost about $60,000, and further additions to the plant in 1910 will cost about $100,000. Additions to the plant since May 31, 1907, have cost $260,000. Approval of the petition is made with the condition that the proceeds from the sale of stock shall be used for "The following purposes and no other, to wit: The proceeds of 1,300 shares to the payment and cancelation of an equal amount of the obligations of the Company represented by its promissory notes outstanding November 30, 1909, and the proceeds of 325 shares to the payment and costs of additions made subsequent to said 30th day of November."

THE stockholders of the newly organized Peaks Island (Me.) Corporation, which was formed as a holding corporation for the water and gas companies recently purchased by a syndicate of Portland (Me.) capitalists, have perfected the following executive organization: President, Silas B. Adams; Vice-President, Scott Wilson; Treasurer, Larry F. Tobie.

THE projectors of the South Delaware Gas Company, which was recently granted a franchise for the construction and operation of a gas works in Seaford, Del., assert that construction work therein will be commenced forthwith.

THE Cruse-Kemper Company reports that it has closed a contract with the United Gas Improvement Company for the construction of a storage holder, up to retaining 1,500,000 cubic feet, on the Harrisburg (Pa.) plant of the latter corporation.

AT the annual meeting of the shareholders in the Graves Supply Company, held in the premises No. 1 West 34th street, New York, some days ago, the officers elected were: President and Treasurer, George W. Graves, Vice-President, George S. Small, Jr.; Secretary, T. L. Small. Mr. G. S. Small fills the vacancy on the Board occasioned by the lamented death of Mr. C. M. Allen, of Rochester, N. Y.; and Mr. Fred. L. Small, who has long been identified with business affairs in New York, succeeds Mr. W. L. Cort, resigned.

W. B. BASCOMB is informed that the corporation which has been organized to supply gas to the Atlantic Highlands district of New Jersey is known as the Atlantic Highlands Gas Company and its officers are: President, Lewis D. Sculthorpe; Vice-President, Ira Antonides; Secretary, Edgar H. Cook; Treasurer, Harry Stile, of

Philadelphia. Among the Executive Committee the names of George W. Davis, of Atlantic Highlands, and R. H. Garrison and H. O. Todd, of Keyport, N. J., are noteworthy. The Treasurer is a resident of Philadelphia.

THE plant of the Newtown Gas Company, of Newtown, L. I., is to be added to by the placing of a gasholder, to rest in concrete tank, up to retaining 500,000 cubic feet.

IN the current allotment for plant betterments the proprietors of the Nebraska City (Neb.) Gas Company have made provision for increasing the distributing lines up to 3 miles or more this year.

"P. L. V.," writing from Boston, Mass., under date of the 11th inst., forwards the following synopsis of the selling schedules agreed to between the authorities of Haverhill, Mass., and the local Gas Company: "A reduction forthwith from $1 to 90 cents per 1,000 cubic feet; 85-cent rate from July 1, 1911; gas for municipal departments at 80 cents; rebates to consumers dating back to July 1 of last year; guarantee that the Companies will increase their tax payments to the city until in 1915 they reach $17,000 per annum; the expenditure of $600,000 for improvements within 5 years, $200,000 this year."

THE Massachusetts Board of Gas and Electric Light Commissioners, after due hearing held in Stoughton on a petition of certain residents of the place named, for an order to reduce the rates for gas and electricity, has rendered the following decision:

"Respecting the supply of electricity, the chief contention was that the maximum price of 20 cents per kilowatt hour for light was too high, and that the prices for power should be uniform. For some time the Stoughton Company has purchased substantially all of its electricity from the Edison Company, of Brockton. Soon after the hearing the Brockton Company acquired the property of the Stoughton Company. Since then the customers of the Stoughton Company have had the full benefit of the Brockton Company's prices and service. Prior to the filing of the petition in this case the maximum net price for electricity was 18 cents per kilowatt hour, but since July 1, 1909, it has been 15 cents. In view of the changed conditions since the complaints were filed, the Board is of the opinion that the present complaint relative to the price of electricity may properly be dismissed. The Company supplies what is commonly known as oil gas. The price now charged of $4.95 per 1,000 cubic feet compares favorably with prices charged elsewhere for oil gas. The same quantity of this gas gives from three to four times as much candle power as the gas in common use, and when burned in an open flame tip the quantity used is only from 20 to 25 per cent. as much as the amount used in other gases. The Company has paid no dividends since 1900, and the income from the gas business has been barely sufficient to cover operating expenses, depreciation and a very slight return upon the investment. Demand for gas in this Company's territory is probably too small to justify the Board in requiring the Company to rebuild its plant for the purpose of supplying either coal or water gas, even if the Board had authority so to do. Numerous suggestions have been made to the Company for specific alterations of its equipment and changes in its manipulations. The Company has recognized the value and practicability of these suggestions and has given the Board satisfactory assurance that it will make the changes as proposed both in its plant and in the method of operation. Since the hearing upon these petitions the gas business in Stoughton, like the supply of electricity, has passed into the hands of the Edison Company, Brockton, so that the Company has the advantage of a stronger financial backing and greater technical skill than ever before. It is plainly the duty of the Company, and the Board has reason to believe that it now intends to supply as good gas as is practicable with a plant of this character, and to remedy promptly and as far as possible recognized defects in the service. As a result of all the facts, the Board is of the opinion that the changes in the plant and method to which the Company is now committed will remove such causes of complaint about quality as are not too fundamental to be corrected by an order which the Board can make, and that until present conditions shall be materially changed there seems to be no occasion for further recommendation as to price or quality."

HERE is another example of how a soulless corporation treated one of its employees. Timothy McNamara, in 1876, entered the employ of the Clinton (Mass.) Gas Light Company as a common laborer, reporting every day in such capacity to the Company's then Superintendent, the late Mr. Milton Jewett. He was young, energetic and willing, and in due time was promoted to a higher position. Age, however, could not be denied, and last month he felt impelled to retire from active service, and accordingly handed in his resignation to President Clarke. Later on, in fact early in April, he received from his ex-Chief a well-worded letter expressing the regard in which he was held by the proprietors of the Company, and inclosing a check for $500 as a practical token of such recognition. There's good work, worthy of noting.

AT the annual meeting of the American Gas Company, held in Philadelphia the 9th inst., Mr. Horatio G. Lloyd (of Drexel & Co.) was chosen a Director. Under the new proceeding of dividing the Board into sections 4 Directors were elected to serve for a period of 3 years, the following gentlemen were chosen: Messrs. M. W. Stroud, John S. Bioren, Horace C. Jones and H. G. Lloyd. The other Directors chosen (all re-elections) were: Messrs. Wm. Carpender and Edmund Penfold, New York; C. J. Carpender, New Brunswick, N.J.; F. H. McCullough, L. A. Riley, Ed. B. Smith, Jno. C. Lowry and Jno. S. Jenks, of Philadelphia.

AT a meeting of the Associated Gas and Electric Company, of Penn Yan, N. Y., which was held in that place the 14th inst., a resolution increasing the capital stock from $1,500,000 to $2,000,000 was adopted.

SOME days ago, at a special election held in Trenton, Mo., for the purpose of determing whether or not bonds in the sum of $55,000 should be issued for the purpose of constructing a lighting plant, to be operated on municipal account, was defeated by a vote of 583 to 324.

IT is reasonably certain that the consent of the authorities of Perkasie, Pa., will be obtained by the Highland Gas Company, which has petitioned for permission to put its main system through the streets of Perkasie.

MR. C. N. QUACKENBUSH, General Manager of the St. Clair County Gas and Electric Company, of East St. Louis, Ills., is overseeing the construction of a new and complete works for the proper supply of gas to East St. Louis and the nearby town of Belleville. The contract for two 8 feet 6-inch water gas sets in connection with such supply has been awarded to the Gas Machinery Company, of Cleveland, O.

THE City Council of Houston Heights, Tex., has granted a franchise for the operation there of a gas works to Mr. H. W. Bennett, who we believe is a resident of Cincinnati, O. Under the terms of the grant the franchise is to run for 50 years. The initial rate per 1,000 cubic feet is put at $1.30, which figure is to rule until the output reaches the daily quantity now being put out by the Houston Gas Light Company; the Company must begin construction work forthwith, and have the same completed in 18 months prior to the lapse of 18 months from April 15, 1910; any such construction work must include the placing of at least 18 miles of mains, and that the quality of gas supplied must be at least equal to that now being sent out in Houston. It is also agreed on that the Bennett syndicate shall execute a bond in the sum of $5,000, to guarantee that the agreements made shall be carried out to the letter.

THE ordinance providing and directing the gas rate in Minneapolis, Minn., stipulates that the selling rate there shall not exceed hereafter $1 per 1,000 gross, less 15 cents for prompt payment.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

953,820. Gas Feeding and Mixing Device. Friend E. Dillon, Maetins Ferry, O., assignor of one-fourth to Charles H. Copp and one-fourth to E. S. Dillon, Wheeling, W.Va.

953,835. Gas Lamp. Frederick J. Humphrey, Kalamazoo, Mich., assignor to General Gas Light Company, same place.

953,864. Dry Meter. Stephen Simpson, Exeter, England.

953,959. Process of Recovering Ammonium Sulphate from Gas. Heinrich Koppers, Essen-on-the-Ruhr, Germany.

954,099. Gas Generator. Gustav A. Heckert, Munich, Germany.

954,239. Dry Gas Meter. Thomas B. Wylie, Osborne, Pa.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHARLES H. WADELTON,
MANAGER.

PUBLISHED ON EACH MONDAY OF THE YEAR AT
No. 42 Pine Street, New York.
Telephone, 2996 John.

MONDAY, APRIL 18, 1910.

The Market for Gas Securities.

The only reason for the increase in the quotations for shares in the Consolidated Gas Company is the better condition of the general market. At the opening to-day (Friday) Consolidated came in at 144½ to 144⅛, which is virtually a gain of 2 points in the week. If real value governed the quotations these would be nearer to 250 than 144⅛. However, investors make the quotations, and there is the end of it.

Brooklyn Union rules strong, and keeps above the 1½ mark with dogged persistence. The figures for it are 150½ to 153. The bonds of this Company are in quite some demand, at 106½ to 107. Peoples, of Chicago, is inclined to go nearer to its real rating. It is 112 to 112½. The regular quarterly dividend of 1½ per cent. on these shares has been declared, and made payable the 25th prox.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

APRIL 18.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	144¼	144⅜
Central Union Gas Co. — 1st 5's, due 1972, J. & J.	3,000,000	1,000	98	101
Equitable Gas Light Co.— Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.— 1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	25	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98½	100½
New York and East River— 1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union— 1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	150½	153
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106½	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	.65	.70
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	73	73½
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,620,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	29,500,000	100	92	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	-	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	458,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	381,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	108	108¾
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis	10,000,000	100	102½	103
Preferred	2,500,000	100	85	95
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co. " 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	78¼	79
Preferred	25,000,000	100	90¾	91
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	112	112¾
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.— 1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112¾	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	104
Washington (D. C.) Gas Co.	1,600,000	200	352½	—
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

Advertisers' Index.

New advertising, or changes in standing ads., to assure attention the issue following their reception, must be in hand on Wednesday.

AMMONIA CONCENTRATORS.
Bartlett-Hayward Co., Baltimore, Md. 761
Fred Bredel Co., Milwaukee, Wis. 758
Michigan Ammonia Works, Detroit, Mich. 741
The Gas Machinery Co., Cleveland, O. 692
Western Gas Construction Co., Fort Wayne, Ind. 720

BURNERS.
Wm. M. Crane Co., New York City. 759

CANNEL COALS.
Perkins & Co., New York City. 758

CEMENTS.
C. L. Gerould, New Castle, Pa. 756
Ernst Strassburger, Chicago, Ills. 756
Laclede-Christy Clay Products Co., St. Louis, Mo. 746

CHARGING BARROWS AND COAL WAGONS.
Davis & Farnum Mfg. Co., Waltham, Mass. 760
Kerr Murray Mfg. Co., Fort Wayne, Ind. 762
The Stacey Mfg. Co., Cincinnati, O. 764

COKE CRUSHERS.
Bartlett-Hayward Co., Baltimore, Md. 761
C. M. Keller, Columbus, Ind. 759

COKE OVEN ENGINEERS.
Albert Ladd Colby, New York City. 741

CONVEYORS—ALL KINDS.
Bartlett-Hayward Co., Baltimore Md. 761
Brown Hoisting Machinery Co., Cleveland, O. 746
Cruse-Kemper Co., Ambler, Pa. 750
C. W. Hunt Company, New York City. 760
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
Fred Bredel Co., Milwaukee, Wis. 758
G. A. Bronder, New York City. 757
Kerr Murray Mfg. Co., Fort Wayne, Ind. 763
The Gas Machinery Co., Cleveland, O. 692
The Stacey Mfg. Co., Cincinnati, O. 763
Western Gas Construction Co., Fort Wayne, Ind. 720

EXHAUSTERS.
Connelly Iron Sponge & Governor Co., New York City 757
Connersville Blower Company, Connersville, Ind. 764
Davis & Farnum Mfg. Co., Waltham, Mass. 760
Isbell-Porter Company, Newark, N. J. 744
Kerr Murray Mfg. Co., Fort Wayne, Ind. 763
Piqua Blower Co., Piqua, O. 749
The P. H. & F. M. Roots Co., Connersville, Ind. 751

GAS AND WATER PIPES.
Davis & Farnum Mfg. Co., Waltham, Mass. 760
Donaldson Iron Co., Emaus, Pa. 752
R. D. Wood & Co., Philadelphia, Pa. 766

GAS BLAST FURNACES.
American Gas Furnace Co., New York City. 744

GAS COALS.
Berwind-White Coal Mining Co., New York and Phila. 758
Perkins Co., New York City. 758
Westmoreland Gas Coal Co., Philadelphia, Pa. 759

GAS COCKS.
H. Mueller Manufacturing Co., Decatur, Ills. 751

GAS ENGINEERS.
Albert Ladd Colby, New York City. 741
Bartlett-Hayward Co., Baltimore, Md. 761
Cruse-Kemper Co., Ambler, Pa. 748
Davis & Farnum Mfg. Co., Waltham, Mass. 760
Drakes Limited, Halifax, England. 741
Edwin E. Witherby, New York City. 741
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Frank D. Moses, Trenton, N. J. 746
Fred Bredel Co., Milwaukee, Wis. 758
Frederick J. Mayer, New York City. 733
Henry I. Lea, Chicago, Ills. 760
H. M. Byllesby & Co., Chicago, Ills. 760
Humphreys & Glasgow, New York City. 760
Improved Equipment Company, New York City. 762
Isbell-Porter Co., Newark, N. J. 744
Kerr Murray Mfg. Co., Fort Wayne, Ind. 763
Laclede-Christy Clay Products Co., St. Louis, Mo. 746
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 756
Quintard Iron Works, New York City. 749
R. D. Wood & Co., Philadelphia, Pa. 765
The Gas Machinery Co., Cleveland, O. 692
The Stacey Mfg. Co., Cincinnati, O. 763
The United Gas Improvement Co., Philadelphia, Pa. 755
Western Gas Construction Co., Fort Wayne, Ind. 720
William A. Baehr, Chicago, Ills. 741
William W. Randolph, New York City. 762

GAS ENRICHERS.
Standard Oil Co., New York City. 711

GAS GAUGES.
The Bristol Co., Waterbury, Conn. 752

GAS GOVERNORS.
Chaplin-Fulton Mfg. Co., Pittsburg, Pa. 767
Connelly Iron Sponge & Governor Co., New York City. 757
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Isbell-Porter Co., Newark, N. J. 744
Pittsburg Meter Co., East Pittsburg, Pa. 746
Reynolds Gas Regulator Co., Anderson, Ind. 757

GASHOLDERS.
Bartlett-Hayward Co., Baltimore, Md. 761
Chicago Bridge and Iron Works, Chicago, Ills. 742
Cruse-Kemper Co., Ambler, Pa. 748
Davis & Farnum Mfg. Co., Waltham, Mass. 760
Deily & Fowler Mfg. Co., Philadelphia, Pa. 764
Kerr Murray Mfg. Co., Fort Wayne, Ind. 763
R. D. Wood & Co., Philadelphia, Pa. 766
Riter-Conley Mfg. Co., Pittsburgh, Pa. 747
The Stacey Mfg. Co., Cincinnati, O. 763
Western Gas Construction Co., Fort Wayne, Ind. 720

GAS MAIN STOPPERS.
Safety Gas Main Stopper Co., New York City. 759

GAS METER CONNECTIONS.
H. Mueller Manufacturing Co., Decatur, Ills. 751

GAS METERS.
American Meter Co., New York and Philadelphia. 767
D. McDonald & Co., Albany, N. Y. 767
Helme & McIlhenny, Philadelphia, Pa. 767
John J. Griffin & Co., Philadelphia, Pa. 768
Keystone Meter Co., Royersford, Pa. 766
Maryland Meter and Mfg. Co., Baltimore, Md. 766
Metric Metal Co., Erie, Pa. 767
Nathaniel Tufts Meter Co., Boston, Mass. 763
New York Improved Meter Co., New York City. 766
Pittsburg Meter Co., East Pittsburg, Pa. 750
Rotary Meter Co., New York City. 765
Sprague Meter Co., Bridgeport, Conn. 765

GAS PLANT TOOLS.
H. Mueller Manufacturing Co., Decatur, Ills..... 751

GAS STOVES.
American Meter Co., New York and Philadelphia..... 767
Keystone Meter Co., Royersford, Pa..... 766
Maryland Meter & Manufacturing Co., Baltimore, Md... 766
Nathaniel Tufts Meter Co., Boston, Mass..... 766

GAS TAPPING MACHINES.
George Light, Dayton, O..... 750
H. Mueller Manufacturing Co., Decatur, Ills..... 751

GAS WORKS APPARATUS AND CONSTRUCTION.
Bartlett-Hayward Co., Baltimore, Md..... 761
Connelly Iron Sponge & Governor New Co., York City. 757
Cruse-Kemper Co., Ambler, Pa..... 748
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Deily & Fowler Mfg. Co., Philadelphia, Pa..... 751
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Gas Engineering Co., Trenton, N. J..... 746
Humphreys & Glasgow, New York City..... 750
Improved Equipment Company, New York City..... 762
Isbell-Porter Co., New York City..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Lloyd Construction Co., Detroit, Mich..... 750
Quintard Iron Works Co., New York City..... 749
R. D. Wood & Co., Philadelphia, Pa..... 766
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 747
The Gas Machinery Co., Cleveland, O..... 692
The Stacey Mfg. Co., Cincinnati, O..... 753
The United Gas Improvement Co., Philadelphia, Pa... 755
Western Gas Construction Co., Fort Wayne, Ind..... 720

HIGH PRESSURE GAS GOODS.
H. Mueller Manufacturing Co., Decatur, Ills..... 751

HOT WATER HEATERS.
Humphrey Co., Kalamazoo, Mich..... 750

INCANDESCENT GAS LAMPS.
General Gas Light Co., Kalamazoo, Mich..... 745
Welsbach Company, Gloucester, N. J..... 754

INCLINED RETORTS.
Baltimore Retort and Firebrick Co., Baltimore, Md... 756
Didier-March Co., New York City..... 753
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Gas Bench Construction Co., St. Louis, Mo..... 749
Improved Equipment Company, New York City..... 762
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 756

MAIN AND SERVICE LAYING.
Sullivan Bros., Flushing, N. Y..... 758

PATENTS, TRADE-MARKS AND COPYRIGHTS.
Royal E. Burnham, Washington, D. C..... 759

PIPE LINE TOOLS.
H. Mueller Manufacturing Co., Decatur, Ills..... 751

PREPAYMENT METER ATTACHMENTS.
New York Improved Meter Co., New York City..... 766

PREPAYMENT METERS.
American Meter Co., New York and Philadelphia..... 767
D. McDonald & Co., Albany, N. Y..... 765
Helme & McIlhenny, Philadelphia, Pa..... 767
John J. Griffin & Co., Philadelphia, Pa..... 768
Keystone Meter Co., Royersford, Pa..... 766
Nathaniel Tufts Meter Co., Boston, Mass..... 766
New York Improved Meter Co. New York City..... 766
Pittsburg Meter Co., East Pittsburg, Pa..... 750
Sprague Meter Co., Bridgeport, Conn..... 765

PROCESSES.
Bartlett-Hayward Co., Baltimore, Md..... 761
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
Fred Bredel Co., Milwaukee, Wis..... 758
Humphreys & Glasgow, New York City..... 760
Improved Equipment Company, New York City..... 762
The Gas Machinery Co., Cleveland, O..... 692
The United Gas Improvement Co., Philadelphia, Pa... 755
Western Gas Construction Co., Fort Wayne, Ind..... 720

PRODUCER POWER PLANTS.
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
R. D. Wood & Co., Philadelphia, Pa..... 766

PURIFIER AND SCRUBBER TRAYS.
Bartlett-Hayward Co., Baltimore, Md..... 761
Cabot Mfg. Co., Hoboken, N. J..... 759
Western Gas Construction Co., Fort Wayne, Ind..... 720

PURIFIERS.
Bartlett-Hayward & Co., Baltimore, Md..... 761
Connelly Iron Sponge & Governor Co., New York City. 757
Cruse-Kemper Co., Ambler, Pa..... 748
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Isbell-Porter Co., Newark, N. J..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
Quintard Iron Works, New York City..... 749
R. D. Wood & Co., Philadelphia, Pa..... 766
The Stacey Mfg. Co., Cincinnati, O..... 763
The United Gas Improvement Co., Philadelphia, Pa... 755
Western Gas Construction Co., Fort Wayne, Ind..... 720

PURIFYING MATERIALS.
Connelly Iron Sponge & Governor Co., New York City 757
F. Behrend, New York City..... 752
The United Gas Improvement Co., Philadelphia, Pa... 755

REGENERATIVE FURNACES.
Baltimore Retort and Firebrick Co., Baltimore, Md.. 756
Bartlett, Hayward & Co., Baltimore, Md..... 761
Didier-March Co., New York City..... 753
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Gas Bench Construction Co., St. Louis, Mo..... 749
Improved Equipment Company, New York City..... 762
J. H. Gautier & Co., Jersey City, N. J..... 756
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Missouri Firebrick Co., St. Louis, Mo..... 756
Parker-Russell Mining and Mfg. Co., St. Louis, Mo... 756

RETORTS AND FIREBRICKS.
Baltimore Retort and Firebrick Co., Baltimore, Md... 756
Didier-March Co., New York City..... 753
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Gas Bench Construction Co., St. Louis, Mo..... 749
Henry Maurer & Son, New York City..... 749
Improved Equipment Company, New York City..... 762
James Gardner, Jr., Co., Bolivar, Pa..... 758
J. H. Gautier & Co., Jersey City, N. J..... 756
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Missouri Firebrick Co., St. Louis, Mo..... 756
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.... 756

SELF-SEALING MOUTHPIECE DOORS.
Bartlett-Hayward Co., Baltimore, Md..... 761
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Fred Bredel Co., Milwaukee, Wis..... 758
Isbell-Porter Co., Newark, N. J..... 744
Improved Equipment Company, New York City..... 762
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 756
Quintard Iron Works, New York City..... 749
R. D. Wood & Co., Philadelphia, Pa..... 766
The Gas Machinery Co., Cleveland, O..... 692
The Stacey Mfg. Co., Cincinnati, O..... 763
Western Gas Construction Co., Fort Wayne, Ind..... 720

(Continued on page 741.)

ANNUAL MEETING.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.

The Annual Meeting of the Stockholders of The United Gas Improvement Company will be held at the office of the Company, Northwest Corner of BROAD AND ARCH STREETS, PHILADELPHIA, on Monday, May 2, 1910, at 12 o'clock, noon, when an election will be held for a President and six (6) Directors to serve for the ensuing year, and such other business transacted as may be brought before the meeting. The stock transfer books will be closed from 3 P.M., Wednesday, April 20, until 10 A.M., Tuesday, May 3d.

1819-2 W. F. DOUTHIRT, Secretary.

SARAH ELIZABETH CRAIG,

Lectures and Cooking Demonstrations with Gas Companies.

Up-to-date methods. Long experience.
Address, 44 EAST McMILLAN STREET,
1819-1 CINCINNATI, O.

Position Wanted.

A First-Class Gas Maker and Gasfitter.

Small plant preferred. Can take full charge of plant. Address, "GAS MAKER,"
1819-1 Care this Journal.

POSITION WANTED

By a Practical Gas Man.

Sixteen years' experience in the manufacture and distribution of both coal and water gas. Employed at present as works foreman of modern plant with daily output of 500,000 cubic feet. Best results assured. Open to accept at once.
1818-2 Address, "GAS MAN," care this Journal.

Position Wanted

By a competent gas man to take charge of the mechanical and new business ends of a gas plant, where thrift and perseverance are essential. A-No. 1 references. Address, "PERSEVERE,"
1819-1 Care this Journal.

WANTED,

A First-Class Draftsman, Accustomed to Gasholder Construction, Gas Apparatus and Structural Work.

State experience and salary expected.
1818-6 Address, "K. K.," care this Journal.

WANTED,

A Good Stoker for Medium Sized Gas Plant.

Steady place for the right party. Must be sober. Married man preferred.
1817-tf Address, "L. L. G.," care this Journal.

WANTED,

By gas company in Eastern New York, first-class accountant, with experience in keeping accounts according to the system of the Public Service Commission. State age, experience, salary expected, and references.
1818-2 Address, "BOOKS," care this Journal.

Demonstrator.

Wanted at once by a Southern gas company, in a city of 25,000, a Southern lady, experienced in demonstrating the economical use of stoves and appliances, to make a house-to-house canvass for a term of six months or one year. Applicants are requested to furnish references and state experience and salary.
1818-tf Address, "G. L. C. C.," care this Journal.

WANTED,

FOUR DRAFTSMEN.

Experience on gas plant construction desirable. Good wages to competent men. Address, "C. M. W.,"
1818-3 Care this Journal.

WANTED,

Experienced Meter Repairer.

Must be competent to keep meter shop records accurately.
QUEBEC RAILWAY, LIGHT, HEAT & POWER COMPANY,
1819-1 QUEBEC, CANADA.

WANTED,

Foreman for Gasfitting Department.

State wages expected.
QUEBEC RAILWAY, LIGHT, HEAT & POWER COMPANY,
1819-1 QUEBEC, CANADA.

OFFICE MEN.

We want young men experienced in gas office work—men with plenty of energy and ambition who will be competent to take charge of local offices. For the right men there will be an excellent opportunity for advancement. State age and past record fully.

C. H. GEIST COMPANY,
LAND TITLE BUILDING,
1819-2 PHILADELPHIA, PA.

FOR SALE,

One set of 4 purifying boxes 12 feet 8 inches by 10 feet 9 inches by 3 feet, in good condition, with centerseal and 10-inch connections.
1771-tf YORK GAS CO., York, Pa.

STANDARD REDUCTION FACTORS for GASES,
By Helon Brooks MacFarland, B.S., M.M.E.
Price, $1.50. *For Sale by*
A. M. Callender & Co., 42 Pine St., New York City.

(*Concluded from page 740.*)

SCRUBBERS AND CONDENSERS.

Bartlett-Hayward Co., Baltimore, Md..... 761
Cruse-Kemper Co., Amler, Pa..... 748
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Economical Gas Apparatus Construc. Co. Toronto, Ont. 752
Evens & Howard Firebrick Co., St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Isbell-Porter Co., Newark, N. J..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
Quintard Iron Works, New York City..... 749
R. D. Wood & Co., Philadelphia, Pa..... 763
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 747
The Gas Machinery Co., Cleveland, O..... 692
The Stacey Mfg. Co., Cincinnati, O. 763
The United Gas Improvement Co., Philadelphia, Pa... 755
Western Gas Construction Co., Fort Wayne, Ind..... 720

STOKING MACHINERY.

Fred Bredel Co., Milwaukee, Wis..... 758
G. A. Bronder, New York City..... 757
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Parker-Russell Mining and Mfg. Co., St Louis, Mo. ... 756

STORAGE TANKS.

Bartlett-Hayward Co., Baltimore, Md..... 761
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Quintard Iron Works, New York City..... 749
The Stacey Mfg. Co., Cincinnati, O..... 763
Western Gas Construction Co., Fort Wayne, Ind..... 720

STREET LAMPS.

Thos. T. W. Miner, New York City..... 741
Welsbach Street Lighting Co., New York and Phila.. 754

TAR AND CARBONIC ACID EXTRACTOR.

Bartlett-Hayward Co., Baltimore, Md..... 761
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
Fred Bredel Co., Milwaukee, Wis..... 758
Isbell-Porter Co., Newark, N. J..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
The Gas Machinery Co., Cleveland, O..... 692
The Stacey Mfg. Co., Cincinnati, O..... 763
The United Gas Improvement Co., Philadelphia, Pa... 755
Western Gas Construction Co., Fort Wayne, Ind..... 720

VALVES.

Bartlett-Hayward & Co., Baltimore, Md..... 761
Davis & Farnum Mfg. Co., Waltham, Mass..... 760
Economical Gas Apparatus Construc. Co., Toronto, Ont. 752
Isbell-Porter Co., Newark, N. J..... 744
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 763
Ludlow Valve Manufacturing Co., Troy, N. Y..... 749
R. D. Wood & Co., Philadelphia, Pa..... 766
The Gas Machinery Co., Cleveland, O..... 692
The P. H. & F. M. Roots Co., Connersville, Ind..... 751
The Stacey Mfg. Co., Cincinnati, O..... 763
Western Gas Construction Co., Fort Wayne, Ind..... 720

VERTICAL S'S.

Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 757
Didier-March Co., New York City..... 753
Evens & Howard Firebrick Co, St. Louis, Mo..... 743
Fred Bredel Co., Milwaukee, Wis..... 758
Gas Bench Construction Co., St. Louis, Mo..... 749
Improved Equipment Company, New York City..... 762
Laclede-Christy Clay Products Co., St. Louis, Mo..... 746
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. .. 756

WATER METERS.

Pittsburg Meter Co., East Pittsburg, Pa..... 750

Utilize Your Gas Liquor.
NO EXTRA LABOR OR OPERATING EXPENSES.
IMPROVED AMMONIA CONCENTRATOR.
About 100 in use. Write to
STROH & OSIUS, Patentees, or
MICHIGAN AMMONIA WORKS, - Detroit, Mich.

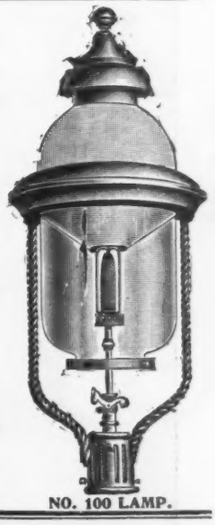
WILLIAM A. BAEHR,
CONSULTING ENGINEER,
Commercial National Bank Building,
CHICAGO.
Also Representing
The Bartlett-Hayward Company.

EDWIN E. WITHERBY,
SPECIAL REPRESENTATIVE
GAS MACHINERY COMPANY,
CLEVELAND, O.,
Will advise on commercial engineering subjects and operation of gas and electric properties.
40 WALL STREET, - NEW YORK.

ALBERT LADD COLBY,
CONSULTING ENGINEER.
ADVICE ON PATENT APPLICATIONS FOR COKING AND BY-PRODUCT RECOVERY.
OFFICE COPIES OF ALL EXISTING PATENTS.
165 BROADWAY, - NEW YORK,
AND
SOUTH BETHLEHEM, PA.

DRAKES
LIMITED,
HALIFAX, ENGLAND.

GAS ENGINEERS AND CONTRACTORS.

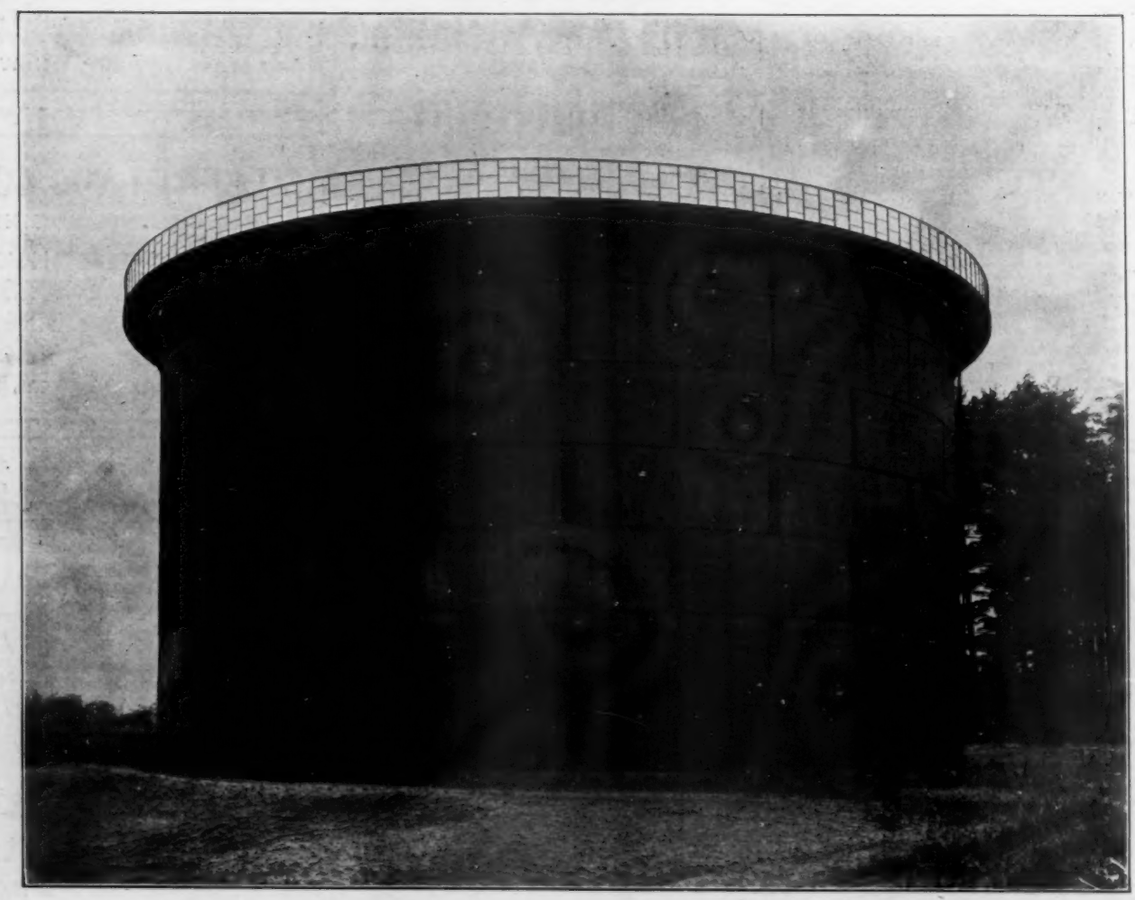
"THE MINER"
GLOBE STREET LAMPS.
OVER FORTY YEARS IN USE THE WORLD OVER.
THE BEST STREET LAMPS
for
ALL KINDS OF GAS OR BURNERS.
This is only one of a Large Variety of Styles.
SEND FOR CATALOGUE.
THOS. T. W. MINER,
821 and 823 Eagle Avenue,
New York.

NO. 100 LAMP.

BINDERS
FOR THE
JOURNAL.
PRICE,
$1.
FOR SALE BY
AMERICAN GAS LIGHT JOURNAL 42 Pine St., New York City.

GAS HOLDERS,

STANDPIPES—OIL TANKS—SCRUBBERS—WATER TOWERS,

DESIGNED, CONSTUCTED AND ERECTED.



Capacity, 2,380.000 gallons. SCHENECTADY, N. Y. City Water Works. Diameter 90 feet. Height, 50 feet.

ESTIMATES ON APPLICATION.

CHICAGO BRIDGE AND IRON WORKS,

MAIN OFFICE AND WORKS:
Washington Heights Station, Chicago.

BRANCH OFFICE:
30 Church St., New York.

EVENS & HOWARD FIRE BRICK CO

LITTLE HINTS.

A man of great perception recently said: "Whenever you encounter a 'knocker' look upon him as your best friend, because he is paying you the greatest compliment when he expresses his very bad opinion of you and of those goods you sell in competition with his own." When an electrical engineer continually goes out of his way to knock your product, he is the best new business getter for the gas man that one could wish for.

We have a lot of salesmen on the road, unintentionally, for us, who are being paid by our competitors. Have you not met the "wise heads," who are so afraid of your product they HAVE TO keep knocking it? May they continue long in the land to the profit of the gas industry in general, and incidentally of our small section of the supply end. What matters it to you how a salesman talks about the other man's bid and his bench? If he cannot talk without trying to tear down somebody else's reputation it only goes to show the reputation assailed is firmly established. Our salesmen have enough good points to talk about on our benches to leave no time to speak of the bad ones in those of others—if there are any bad ones. If there is any gas manager who spends most of his time in trying all he knows to put the electrical man out of business, by speaking on the slightest pretext about the high cost, low efficiency, danger, instability and general fatuity in the use of electricity, he will find he has stepped on a live wire, which he cannot get away from readiy, and which will at least hold him a while, until probably his own plant and product are little better than the worst he has been able to call his competitors.

We are happy in the quantity and quality of our querulous "knockers." We work while they sleep. They work for us when we are hustling for ourselves. The extent of our combined efforts recently is written in a contract for a new retort house, with two stacks of 10 benches in each, with 320 retorts, all our own design of ironwork, 2 chimneys and 2 patent governors. There is a good "hint" right from our own city. An equally good one is from New Brunswick for 4 benches of 6's, and another from Alberta, full depth 9's in this case. There are others.

GAS WORKS DIVISION, - - - - - - - - - - A. S. B. LITTLE, Engineer.

SAINT LOUIS · MISSOURI

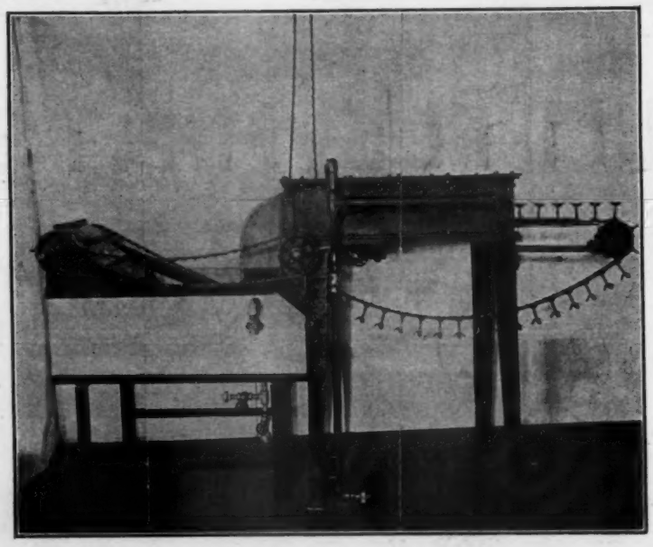
GAS FURNACES and HEATING MACHINES

STATE

AMOUNT -
SIZE - -
KIND - -

OF WORK

to be done in given time.



Heating Machine for Treating Watch Case Blanks and Other Similar Work, with Cooling Bath Attachment.

FOR

INDUSTRIAL PURPOSES.

CATALOGUE SENT ON APPLICATION.

AMERICAN GAS FURNACE COMPANY,
24 John Street, New York, N. Y.

J. S. DeHART, JR., PRESIDENT

A. F. WEHNER, SECRETARY

R. K. WEHNER, TREASURER

ISBELL-PORTER COMPANY

GAS ENGINEERS & BUILDERS OF GAS WORKS

BENCH WORK

CHARGING AND DISCHARGING MACHINERY

MACKENZIE EXHAUSTERS

PRIMARY AND SECONDARY CONDENSERS FOR FRESH OR SALT WATER

ISBELL VALVES SPECIALS

TAR EXTRACTORS

P.&A. TAR EXTRACTORS FOR WATER GAS

ROTARY AMMONIA SCRUBBERS

SHAVING SCRUBBERS PURIFIERS STREET GOVERNORS

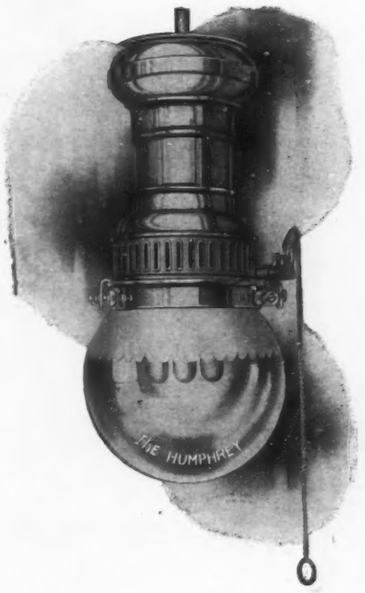
MAIN OFFICE AND WORKS
BRIDGE & OGDEN STREETS
NEWARK, N.J.
ESTABLISHED 1865

ANYBODY CAN STRING WORDS TOGETHER.

THINK IT OVER.

WE SELL MORE HUMPHREY
INVERTED GAS ARC LAMPS
THAN ALL OTHER
KINDS MADE.

WHY?



THINK IT OVER.

GENERAL GAS LIGHT COMPANY.

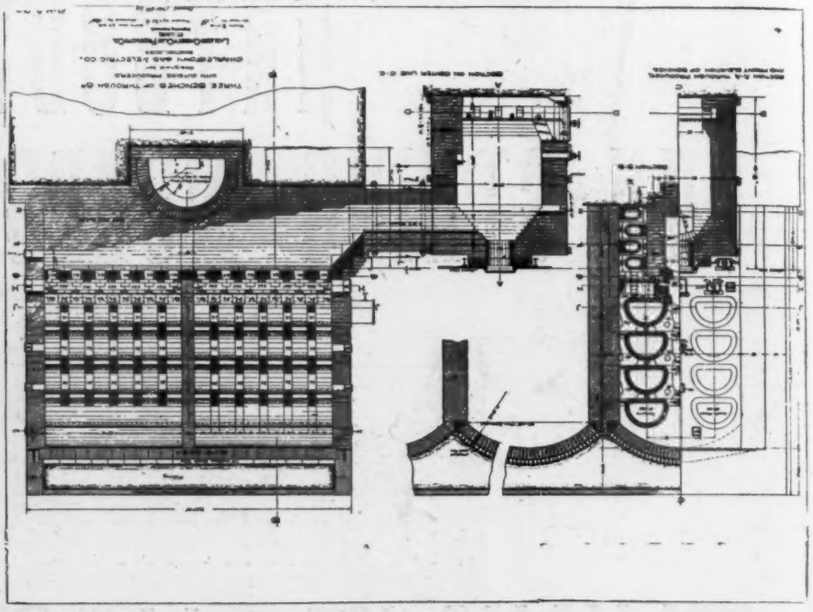
Kalamazoo. New York. San Francisco.
London, England. Bremen, Germany. Wellington, New Zealand.

WE BUILD ALL TYPES OF BENCHES.

We built three of these benches complete last season and now have the contract for remodeling four more benches.

These benches are reducing **2,300** cubic feet of GAS PER RETORT per 24 hours, with a yield of **5.75** cubic feet of **17.5**-CANDLE POWER gas—No enricher.

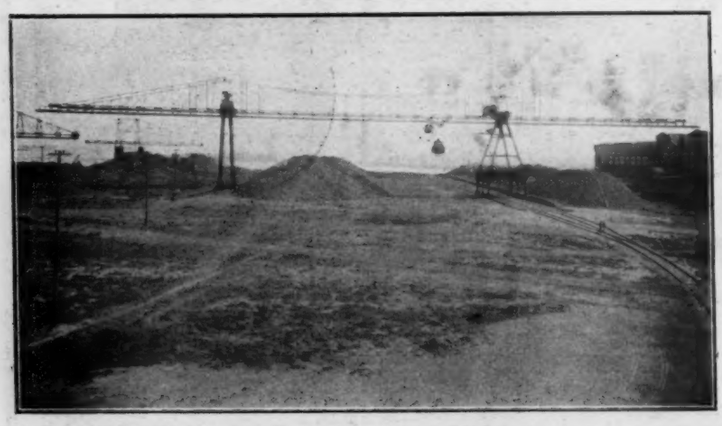
(Tested on old D Sugg Argand Burner.)



BENCHES OF THROUGH EIGHTS, WITH RETORTS 20 FEET LONG AND OUTSIDE PRODUCERS, BUILT FOR THE CHARLESTOWN GAS AND ELECTRIC COMPANY, CHARLESTOWN, MASS.

LACLEDE-CHRISTY CLAY PRODUCTS CO.,

ST. LOUIS, MO.



A view of one of "Brownhoist" recent installations for the rapid and economical handling of material.

Bridge Tramway handling coal at Astoria Light, Heat and Power Company's plant, Astoria, N. Y.

The Brown Hoisting Machinery Company.

CLEVELAND, O.

LONG DISTANCE TELEPHONE, 1503-D. FRANK D. MOSES, President.

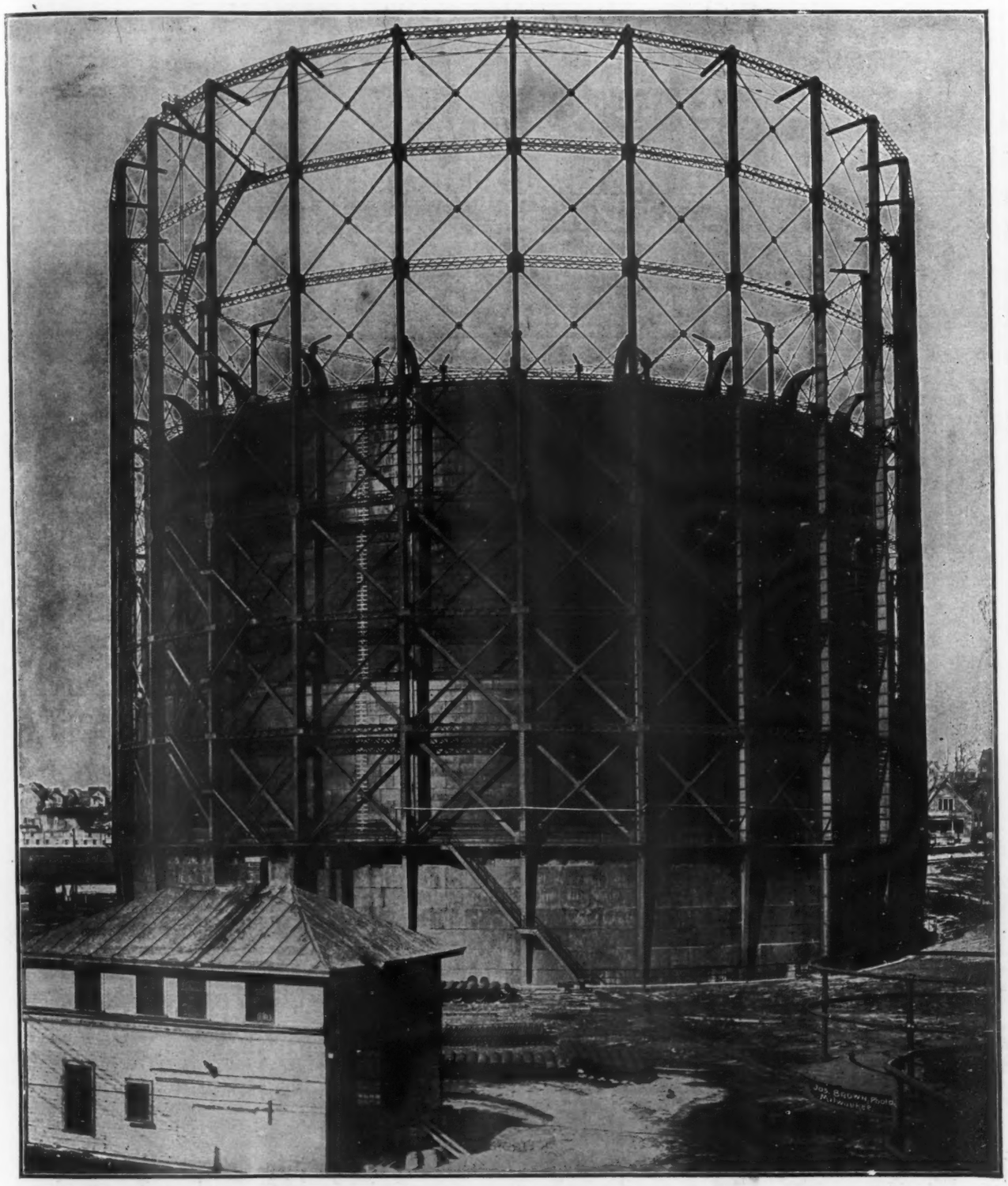
GAS ENGINEERING CO.,

MANUFACTURERS AND ERECTORS OF

COMPLETE GAS WORKS.

SPECIAL ATTENTION GIVEN TO LARGE PURIFIERS.

OFFICE AND WORKS, - - - - - - TRENTON, N. J.



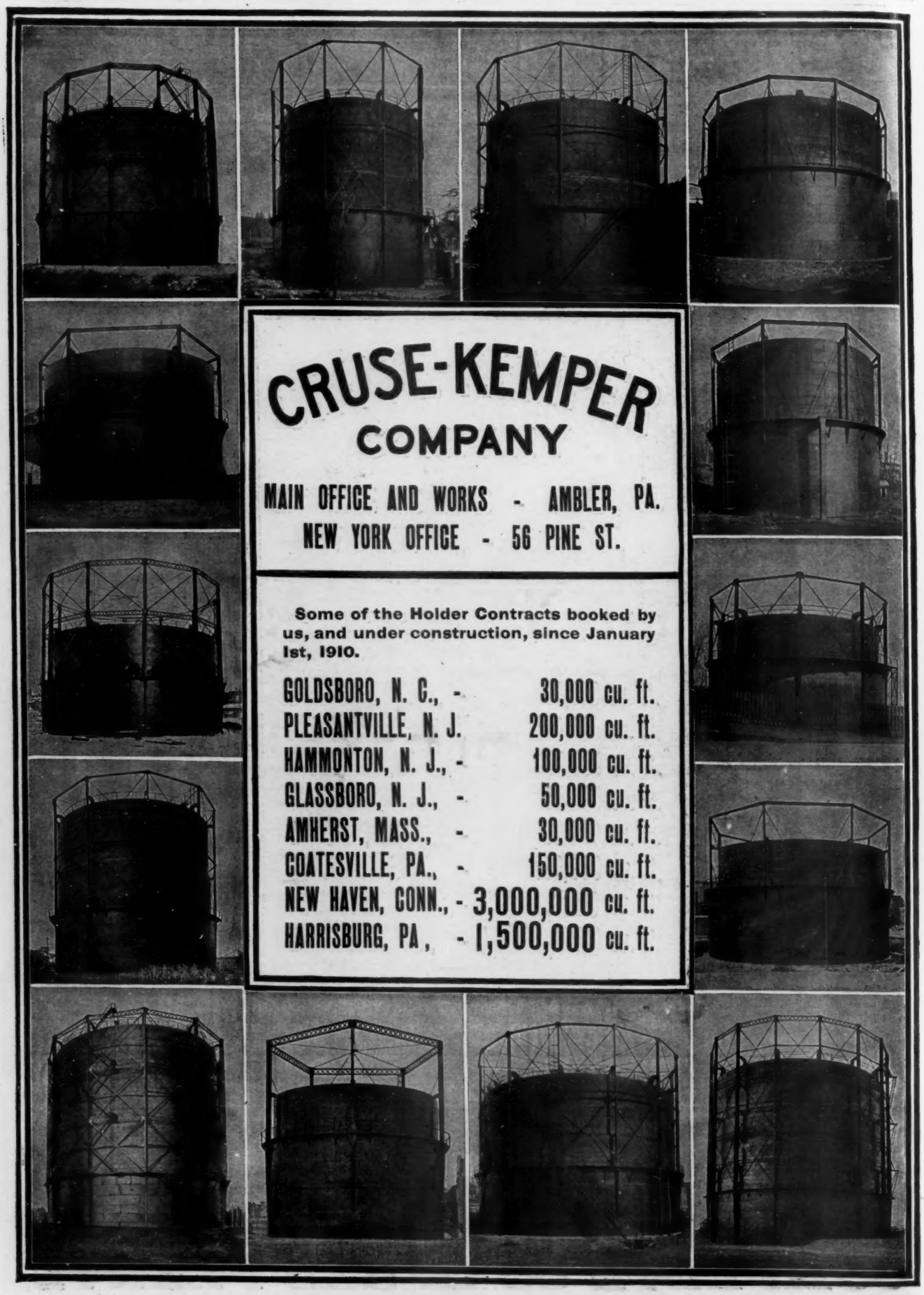
The Largest Steel Tank Gasholder in the World, 225 Feet 9 Inches Diameter, 35 Feet Deep, Five Lifts.

RITER-CONLEY MFG. CO.,

PITTSBURGH.

PLATE AND STRUCTURAL WORK OF EVERY DESCRIPTION.

COMPLETE COAL GAS PLANTS.


CRUSE-KEMPER
COMPANY
MAIN OFFICE AND WORKS - AMBLER, PA.
NEW YORK OFFICE - 56 PINE ST.
Some of the Holder Contracts booked by us, and under construction, since January 1st, 1910.
GOLDSBORO, N. C., - 30,000 cu. ft.
PLEASANTVILLE, N. J. 200,000 cu. ft.
HAMMONTON, N. J., - 100,000 cu. ft.
GLASSBORO, N. J., - 50,000 cu. ft.
AMHERST, MASS., - 30,000 cu. ft.
COATESVILLE, PA., - 150,000 cu. ft.
NEW HAVEN, CONN., - 3,000,000 cu. ft.
HARRISBURG, PA, - 1,500,000 cu. ft.

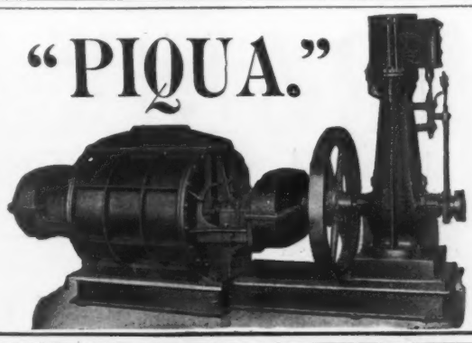
GAS EXHAUSTERS AND BLOWERS.

We have a full line of sizes for all standard pressures. The design, material and workmanship is A-1. Prompt Delivery and Reasonable Prices. WHY NOT give us YOUR requirements?

THE PIQUA BLOWER CO.,

PIQUA, OHIO.

"PIQUA."



THE

Ludlow Valve Mfg. Co.,

TROY, N. Y., U. S. A.

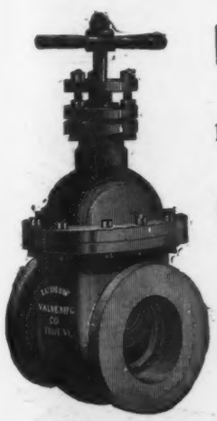
Double and Single Gate Valves, ¾" to 72",

—FOR—

Gas, Water, Steam, Oil, Ammonia, Etc.

HOT GAS VALVES A SPECIALTY.

Send for Catalogue.



QUINTARD IRON WORKS CO.,

Foot of Twelfth Street and East River, New York,

BENCH WORK,
CONDENSERS,
SHAVING SCRUBBERS,
CAST IRON FLANGED PIPE,
RIVETED STEEL PIPE.

FREDERICK W. FLOYD, Engineer.

ESTABLISHED 1856.

HENRY MAURER & SON,

Manufacturers of

High Grade Firebrick, Blocks, Tiles,

ETC.,

Works: Maurer, N. J. Office: 420 E. 23d St., N. Y. City.

GAS BENCH CONSTRUCTION CO.,

ST. LOUIS, MO.

COAL GAS BENCHES.

HORIZONTAL.——INCLINED.——VERTICAL.

WE HAVE ALL TYPES and SIZES IN SUCCESSFUL OPERATION.
BUILT AFTER OUR OWN DESIGNS and WITH OUR OWN MATERIALS.

WATER GAS LININGS, CHECKERBRICK.

ALL WORKMANSHIP, MATERIAL AND RESULTS GUARANTEED.

JUST PUBLISHED.

Catechism of Central Station Gas Engineering in the United States.

Compiled from the questions and answers sent out to the Practical Class, Trustees Gas Education Fund.

Section I. General Definitions. Section II. Manufacturing Materials. Section III. Manufacturing Plant---Construction and Operation. Section IV. Distribution System and Consumers' Appliances. Section V. Chemical. Section VI. Physical. Section VII. Masonry Construction. Section VIII. Miscellaneous.

6¼ INCHES BY 9 INCHES. 672 PAGES. ILLUSTRATED.

PRICE:

Cloth, $5 net, plus postage. Flexible Leather, $7 net, plus postage.

For Sale by TRUSTEES GAS EDUCATIONAL FUND, 58 William Street, New York City.

IRONCLAD

THE 100% METER

CAST IRON, DRY,

Gas Meters

MORE THAN STANDARD

In the early development of meter making, the tin gas meter was considered standard. It had many good qualities and we embodied these in the IRONCLAD.

The objectionable features were overcome in IRONCLAD construction--so we offer you a meter that is

MORE THAN STANDARD

Straight or Circular Reading Registers

CATALOG 100 FREE

Pittsburg Meter Co.

Main Office and Works:

East Pittsburg, Pa.

New York, 149 Broadway.
Chicago, 256 Madison Street.
Kansas City, 6 West 10th Street.
Seattle, 8th and Madison Streets.
San Francisco, 149 New Montgomery Street.

MANUFACTURERS OF GAS METERS AND WATER METERS

ORDER NOW

TO GET PROMPT SHIPMENT.

HUMPHREY AUTOMATIC GAS WATER HEATERS

Have the valve at the top; easy and cheap to connect; a sootless bunsen flash pilot; a galvanized, rust-proof, non-clogging burner, and many other things making for trouble freedom and high efficiency. ∴ ∴ ∴ ∴

GUARANTEED.

They Make Pleased Users

HUMPHREY CO.,

Kalamazoo, Mich.

LLOYD CONSTRUCTION COMPANY

GAS APPARATUS.

DETROIT - MICHIGAN

BY USING

THE SAFEST, SIMPLEST, STRONGEST AND MOST SATISFACTORY

PREPAYMENT METERS.

TRY THEM

AND YOU WILL BE CONVINCED OF THEIR EXCELLENCE.

NEW YORK IMPROVED METER CO.,

306-310 EAST 47TH ST., NEW YORK CITY.

PACIFIC COAST REPRESENTATIVES:

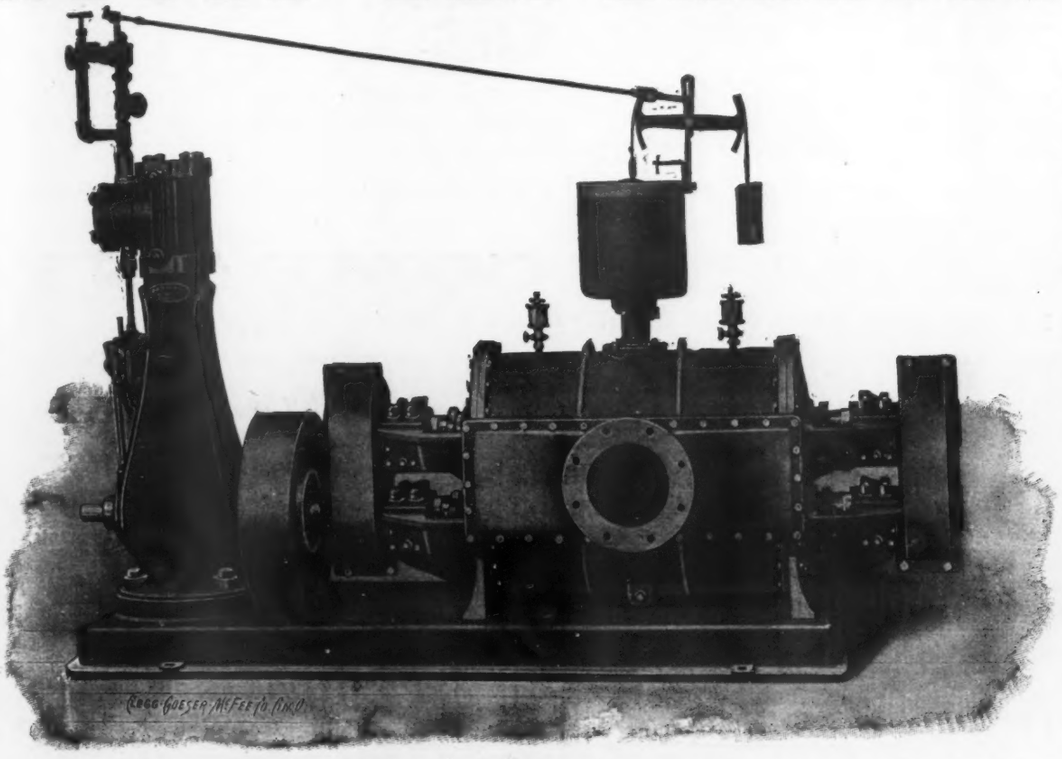
NORTHWEST GAS EQUIPMENT COMPANY, PORTLAND, ORE.

PUBLIC LIGHTING TABLES FOR APRIL, 1910.

[COMMUNICATED BY THE AMERICAN METER COMPANY.]

Day of Week.	Table No. 1. FOLLOWING THE MOON. Date.	Light.	Extinguish.	Day of Week.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Date.	Complete Lighting in 1 Hour.	Complete Extinguishing in 50 Minutes.
						From Time Given.	
		P.M.				P.M.	A.M.
Fri.	1	6.50	2.10 A.M.	Fri.	1	5.57	4.47
Sat.	2	6.50 L.Q.	3.10	Sat.	2	6.07	4.37
Sun.	3	7.00	3.50	Sun.	3	6.07	4.37
Mon.	4	7.00	4.30	Mon.	4	6.07	4.37
Tue.	5	7.00	4.30	Tue.	5	6.07	4.37
Wed.	6	7.00	4.30	Wed.	6	6.07	4.32
Thu.	7	7.00	4.30	Thu.	7	6.07	4.32
Fri.	8	7.00	4.30	Fri.	8	6.07	4.32
Sat.	9	7.00 N.M.	4.30	Sat.	9	6.17	4.22
Sun.	10	7.10	4.30	Sun.	10	6.17	4.22
Mon.	11	7.10	4.30	Mon.	11	6.17	4.22
Tue.	12	7.10	4.30	Tue.	12	6.17	4.22
Wed.	13	7.10	4.30	Wed.	13	6.17	4.22
Thu.	14	11.40	4.30	Thu.	14	6.17	4.22
		A.M.					
Fri.	15	12.40	4.30	Fri.	15	6.17	4.22
Sat.	16	1.20 F.Q.	4.30	Sat.	16	6.27	4.17
Sun.	17	2.00	4.20	Sun.	17	6.27	4.17
Mon.	18	2.30	4.20	Mon.	18	6.27	4.17
Tue.	19	3.00	4.20	Tue.	19	6.27	4.12
Wed.	20	3.20	4.20	Wed.	20	6.27	4.12
Thu.	21	3.40	4.20	Thu.	21	6.27	4.12
Fri.	22	4.00	4.20	Fri.	22	6.27	4.12
Sat.	23	No L.	No L.	Sat.	23	6.37	4.02
Sun.	24	No L. F.M.	No L.	Sun.	24	6.37	4.02
Mon.	25	No L.	No L.	Mon.	25	6.37	4.02
Tue.	26	7.20 P.M.	10.00 P.M.	Tue.	26	6.37	4.02
Wed.	27	7.20	11.10	Wed.	27	6.37	4.02
Thu.	28	7.20	12.10 A.M.	Thu.	28	6.37	4.02
Fri.	29	7.20	1.00	Fri.	29	6.37	4.02
Sat.	30	7.20	1.50	Sat.	30	6.47	3.52

ROOTS' GAS EXHAUSTERS.



Sizes for any required capacity.

Self-oiling, adjustable bronze bearings.

Most perfect and sensitive Governor.

Write for Catalogue.

P. H. & F. M. ROOTS COMPANY,

HOME OFFICE:
Connersville, Ind.

NEW YORK OFFICE:
120-122 Liberty St.

CHICAGO OFFICE:
1547 Marquette Bldg.

SEND FOR POCKET EDITION OF "ENGINEERS' PRACTICAL REFERENCE BOOK."

What Makes The Pudding Taste Good

Is not merely the cooking. It is the things the cook puts in and properly mixes. It is the same way with Mueller Gas Cocks. The component parts of the red brass are properly mixed and the metal made right before it is cast.

Mueller Extra Gas Stove Cocks are made in six patterns, flat, tee and socket head, with or without check. Each cock is tested, stamped with the name MUELLER and Unconditionally Guaranteed.

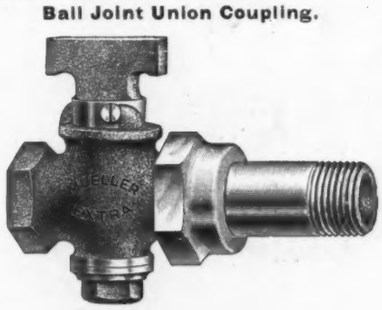
TRADE MARK
MUELLER
REGISTERED

H. MUELLER MFG. CO.

Works and General Offices,
DECATUR, ILL., U. S. A.
West Cerro Gordo St.

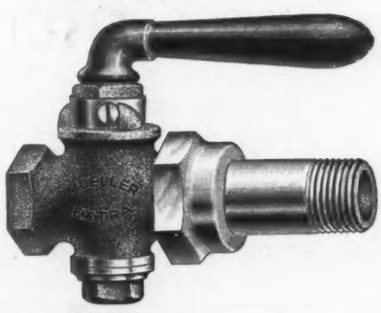
Eastern Division,
NEW YORK, N. Y., U. S. A.
254 Canal St. (cor. Lafayette).

TEE HEAD WITH CHECK.
Ball Joint Union Coupling.



D-15304.

SOCKET HEAD WITHOUT CHECK.
Ball Joint Union Coupling.



D-15305.

BRAY BURNERS HAVE BEEN USED FOR MORE THAN FORTY YEARS.

In that time they have been recommended and used by the leading gas experts, endorsed by the U. S. Government Inspectors of Gas, as well prominent State Inspectors.

To-day the Bray is the only high-grade, absolutely reliable open flame burner on the market.

W. M. CRANE COMPANY,

16, 18 and 20 West 32d Street, New York,

SOLE AGENTS FOR GEO. BRAY & CO., LEEDS, ENGLAND.

GEORGE ORMROD, Pres. & Treas. JOHN D ORMROD, Supt.
J. G. EBERLEIN, Secretary.

EMAUS PIPE FOUNDRY.

DONALDSON IRON COMPANY. EMAUS, PA.

CAST IRON GAS & WATER PIPE

MANUFACTURERS OF

CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

Also, FLANGE PIPE, LAMP POSTS, Etc.

COMBINATION INDICATING AND RECORDING UNITS OF WILLIAM H. BRISTOL ELECTRIC

PYROMETERS,

ESPECIALLY ADAPTED FOR GAS MANUFACTURING PLANTS.

Indicating instrument installed on Gauge Board for Gas Maker. Recording instrument installed in Superintendent's Office.

Write for Special Bulletin No. 116 explaining applications of these Pyrometers in Gas Works of many Gas Manufacturing Companies. This new bulletin also gives lists of Gas Companies using the Wm. H. Bristol Electric Pyrometers.

THE BRISTOL CO., WATERBURY, CONN.

BRANCH OFFICES: NEW YORK. PITTSBURG. CHICAGO

THE ECONOMICAL GAS APPARATUS CONSTRUCTION COMPANY, LIMITED,

Consulting Engineers.

Builders of UP-TO-DATE Machinery and Appliances for Coal and Water Gas Plants. :: :: :: :: ::

PLANS,
SPECIFICATIONS
AND ESTIMATES
PREPARED.

AMERICAN OFFICE:
269 Front St., East, Toronto, Canada.

Celebrated Lux Gas Purifying Mass

Will Save 50 Per Cent. Labor.

Used in the Gas Works of Berlin, Kiel, Frankfort, Vienna, Amsterdam, Antwerp. London, Edinburgh, Copenhagen, Madrid, Seville, Barcelona, Rio de Janeiro and others. :: :: ::

Sole Importer, F. BEHREND,
54 Front St., New York.

BINDER

FOR THE

JOURNAL.

PRICE, $1.

FOR SALE BY

A. M. CALLENDER & CO., - 42 Pine St., New York.

PRACTICAL HANDBOOK ON GAS ENGINES, WITH INSTRUCTIONS FOR CARE AND WORKING OF THE SAME,

By G. LIECKFELD, C.E. Translated with Permission of the Author, by GEORGE M. RICHMOND, M.E. Price, $1.

For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine Street, New York City.

DIDIER-MARCH COMPANY,

Hudson Terminal Building,

WORKS:
Keasbey, Perth Amboy, N. J.

50 Church Street,
NEW YORK, N. Y.

DESSAU SYSTEM OF VERTICAL RETORTS,

"The Only System in Successful Operation."

U. S. Patent No. 904043.
"Process Patent for the Carbonization of Coal in Vertical Retorts."

U. S. Patent No. 801268.
"Operating Mechanism for Bottom Mouthpieces."

U. S. Patent No. 906187.
"Feeding Device."

U. S. Patent No. 899503.
"Retort House."

U. S. Patent No. 915156.
"Recuperation."

388 Benches, with 3984 Retorts in operation and under construction.

TOTAL DAILY PRODUCING CAPACITY, 60,000,000 CUBIC FEET.

First Installation in the United States of America,

PROVIDENCE, R. I., 12 BENCHES, 120 RETORTS,

Complete, with

Retort House, Coal and Coke Handling Machinery and Storage Bins.

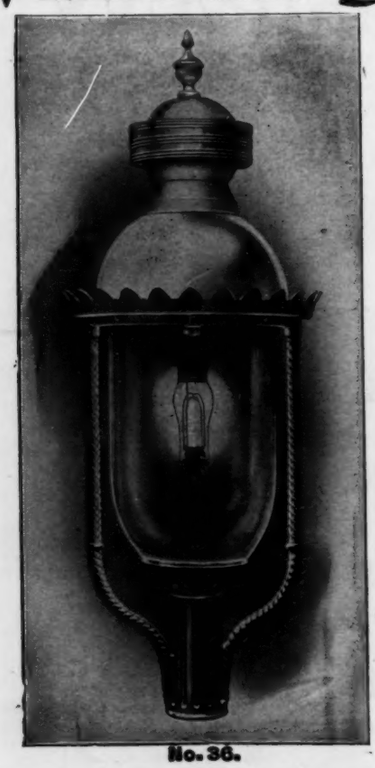
HORIZONTALS AND INCLINES OF APPROVED TYPES.

Correspondence Solicited. **FREDERICK J. MAYER, General Manager.**

NEW YORK, 318 West 42d Street. BOSTON, 820 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY

OF AMERICA



No. 36.

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others Interested in Municipal and Outside Lighting.

No. 38.

REFLEXOLIERS.

No. 1031.

As an effective, efficient illuminant the Reflexolier marks a greater advance over the old methods of Gas Lighting than does the Tungsten over the Electric.

The Reflexolier is the ideal unit not only to hold present business, but best adapted to the needs of the Gas Company's new business department.

For the Reflexolier meets all the points of your competitors—and goes them several better in color value, maintenance cost, flexibility and attractive appearance.

No. 1032.

Note:—No. 1031 *is the Standard Reflexolier*—No. 1032 *is designed to meet the demand for a more ornamental Fixture. Both finished in brushed brass—both furnished in* 2, 3 *and* 4 *lights.*

Write for Discounts

WELSBACH COMPANY,

Gloucester, N. J. FACTORIES Columbus, O.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

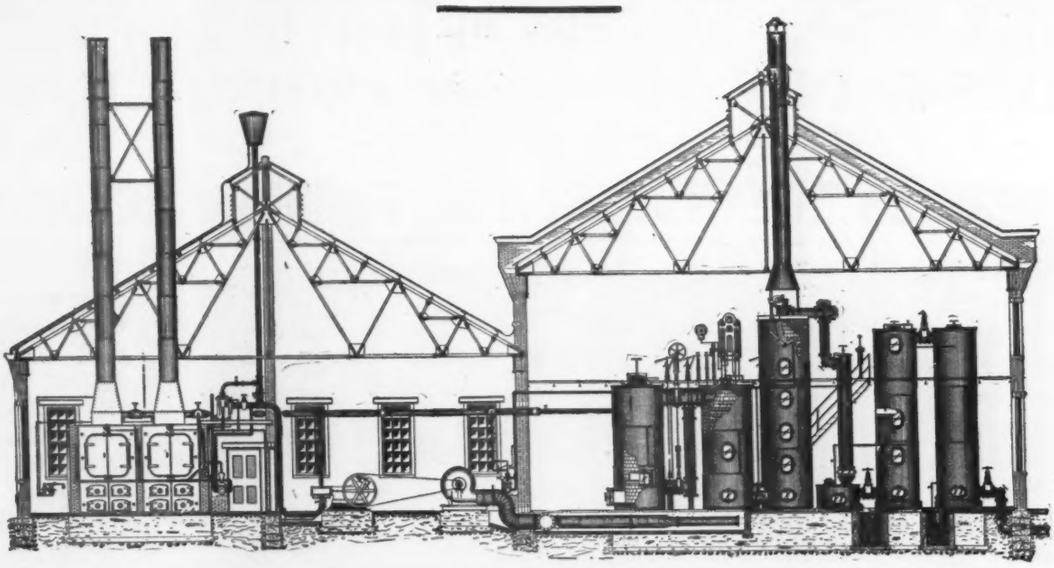
LESSEES, OPERATORS AND BUILDERS OF **GAS WORKS.**

Largest Builders of CARBURETTED WATER GAS PLANT IN AMERICA.

SOLE AMERICAN BUILDERS

OF THE

Standard Double-Superheater Lowe Water Gas Apparatus.



1909 CONTRACTS.

Belmar, N. J.	St. Albans, Vt.	Brockton, Mass.	Rosslyn, Va.
Abilene, Tex.	Jersey City, N. J.	Rockville, Conn.	Auburn, N. Y.
Pawtucket, R. I.	Everett, Mass.	Bay Shore, N. Y.	Lewiston, Me.
Middletown, Conn.	Burlington, Ia.	Sag Harbor, N. Y.	Moline, Ills.
Weatherford, Tex.	Des Moines, Ia.	Wilmington, Del.	Aurora, Ills.
New Bedford, Mass.	Pelham, N. Y.	Hammond, Ind.	Goldsboro, N. C.
Dallas, Tex.	Pleasantville, N. J.	Sumter, S. C.	Hoopeston, Ills.

TOTAL NUMBER OF SETS INSTALLED DURING YEAR 1909, ... 31
TOTAL NUMBER OF SETS INSTALLED TO JANUARY 1, 1910, ... 721
TOTAL DAILY CAPACITY TO JANUARY 1, 1910, ... 585,590,000 cu. ft.

Tar Extractors for Carburetted Water Gas
Photometrical Apparatus.
Gas Analysis Apparatus.
Recording Gauges.
Straight Standpipe System for Coal Gas Retorts.
Straight Standpipe Cleaners.
Waste Heat Boiler.
Hygrometer.
Meters for Regulating Air and Steam Supply to Water Gas Apparatus.
Emergency Kits for Persons Overcome by Gas.
Emergency Kits for Electric Shock.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

J. H. Gautier & Co.

Greene & Essex Streets,
Jersey City, N. J.

MANUFACTURERS OF

CLAY GAS RETORTS, FIRE CLAY TILES, FIRE BRICK and FIRE CLAY SPECIALTIES.

Ground Fire Clay, Fire Sand and Ground Fire Brick in Barrels and Bulk.

SOLE MANUFACTURERS OF THE

FLEMMING GENERATOR GAS FURNACE

GEROULD'S IMPROVED RETORT CEMENT

A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining flat furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

Price List, f.o.b. NEW CASTLE, PA.

In Casks, 400 to 800 pounds, at 5 cents per pound.
In Kegs, 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

C. L. GEROULD,
29 North Mill St., New Castle, Pa.

KRATER-DINAS RETORT CEMENT.

Universally accepted to be the best cement for patching and repairing retorts, making up bench work, etc. Advantages: Powdered form; only mix with water; no waste; too much mixed, apply water and use the next time; adheres very easy; does not fall out by decarbonization. We guarantee or take back. Many re-orders and recommendations from America, Germany, France, Belgium, etc. Write for price and testimonials.

ERNST STRASSBURGER, Sole Importer,
2630 Lincoln Avenue, Chicago, Ills.

"BEST BY TEST."

ESTABLISHED 1868.

L. N. RANCKE, V. Pres. & Mgr. E. L. RIEHA, Engineer.

BALTIMORE RETORT & FIRE BRICK COMPANY.

COAL GAS BENCHES.

HORIZONTAL RETORTS.
INCLINED RETORTS.
VERTICAL CHAMBERS.

WALDO BROS., 102 Milk St., BOSTON, MASS.
NEW ENGLAND AGENTS.

THE PARKER-RUSSELL MINING AND MFG. CO.,

Saint Louis, Missouri. New York Office, 45 Broadway.

GAS RETORT BENCHES OF ALL DESCRIPTIONS.

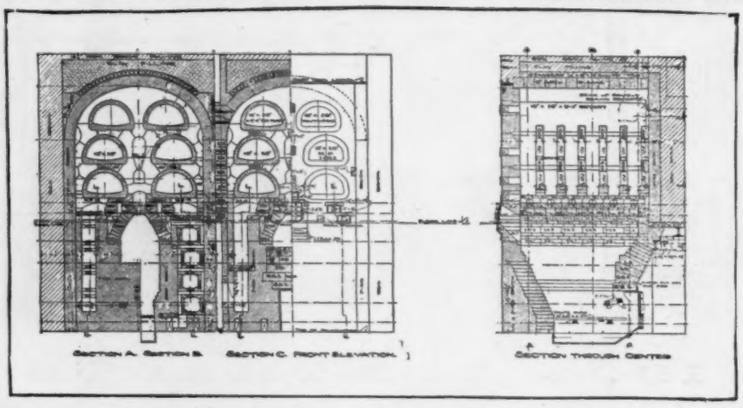
FIDDES-ALDRIDGE DISCHARGING-CHARGING MACHINES.

BEST ON THE MARKET FOR THROUGH RETORTS.

Rear Clinkering Benches have Decided Advantages and are favored by many

No iron floor or pits required in front of furnaces.

Note superiority of recuperators and design of settings.



We mine our own clay and manufacture our own retorts and other fireclay goods. We KNOW they are Good when shipped and are responsible for their quality. ∴ ∴ ∴

Correspondence Solicited.

All Contracts Made as of St. Louis.

BENCHES.

VERTICAL.--We erect Vertical Benches on the continuous and intermittent systems. We are the Sole Agents of the United States and Canada west of Buffalo, Pittsburg and Toronto, for the Woodall-Duckham Continuous System. We consider this the best system on the market. There is one installation in successful operation at La Grange, Ills. High yield. Very low cost of labor.

JOHN DELL,
President and General Manager.

MISSOURI FIRE BRICK CO.,

ESTABLISHED 1882.

MANUFACTURERS OF

Gas Retorts, Bench Settings, Fire Brick, Cupola Linings, Etc.

We are the **Exclusive Agents** *for the* **Mitchell Patent Benches,** *Constructed with Half or Full Depth Furnaces, to Burn either Coal or Coke, and Arranged for Front or* **Rear Clinkering.** **The Mitchell** *is the* **Original Coal Firing Bench.** *We also Erect Plain Benches with* **One to Six Retorts.**

YOUR CORRESPONDENCE IS RESPECTFULLY SOLICITED.

City Office: *411 Olive Street, Continental Bank,* ST. LOUIS, MO.

EXPERT INSPECTION of Holders and Other Structures During Construction.
ECONOMIC DESIGN of Steel Structures, Reinforced Concrete, Masonry and Foundations.
CHAMBERS & HONE, Consulting Engineers. - - - - - - - - 1 Liberty Street, New York City.

Bronder Patent Stoking Machinery.

Three-Scoop and Three-Rake Charging and Discharging Machines are operating in New York, Newark, N. J., Philadelphia, Worcester, Mass., Mt. Vernon, N. Y., Toronto and Montreal, Canada, Detroit, Seattle, Rochester and St. Louis.

Four-Scoop and Four-Rake Charging and Discharging Machines are operating in Detroit, Mich., and Cincinnati, Ohio. These are the only machines that will draw or charge simultaneously 3 or 4 retorts (vertically) and handle from 42 to 60 retorts in from 25 to 30 minutes, lid opening and closing and filling of furnaces included.

Hot Coke Conveyor, Quencher and Steam Exhauster, operating in Toronto, Canada, working in water-sealed flue, rollers being protected from heat and grit.

COAL CRUSHERS, CONVEYORS AND BINS. TURNTABLES FOR MACHINES.

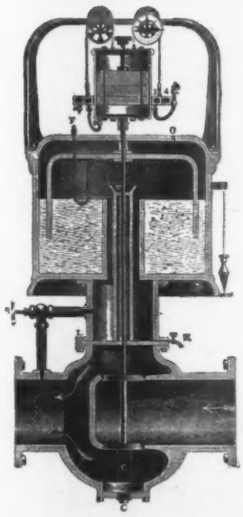
Labor-Saving Machines for Handling Coal and Coke from Coal Cars to Coke Yard or Bins. Coke Screening and Measuring Plants a Specialty.

G. A. BRONDER,

Contracting Engineer and Builder,

229 BROADWAY, NEW YORK.

CONNELLY IRON SPONGE AND GOVERNOR CO.,



Automatic, Balance, High Pressure and Service Governors,

Unison Telemetric Pressure Gauge,

Iron Sponge, Purifying Material for Gas Purification, Manufacturers of Jones Jet Photometers, The National Smoke and Ammonia Helmet, Sulphur Testers, High and Low Pressure House Governors.

Wide Experience in High Pressure Installation and Extension.

PACIFIC COAST AGENT: VAN E. BRITTON, SAN FRANCISCO, CAL.

50 CHURCH ST., NEW YORK CITY.
295 WEST 22D ST., CHICAGO, ILLS.

12-Inch High Pressure Governor.

REYNOLDS' GAS REGULATOR COMPANY,

ANDERSON, IND., U. S. A.

We make all sizes for all classes of reduction,

Double and Single District Stations,

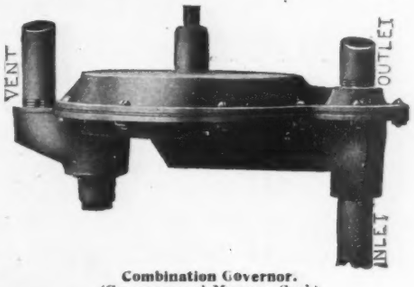
And Individual Service Governors for Reducing High Pressure.

HOLDER GOVERNORS

And Low Pressure Regulators, all of the Dry Diaphragm type.

English Agents:
THE BRYAN DONKIN CO., LTD., Chesterfield, England.

Write for Catalog.



Combination Governor.
(Governor and Mercury Seal.)

FIELD'S ANALYSIS FOR THE YEAR 1908.

PRICE, $5. FOR SALE BY

AMERICAN GAS LIGHT JOURNAL, 42 Pine St., New York City.

COAL TAR AND AMMONIA,

By GEORGE LUNGE, PH.D. Third and Enlarged Edition.

Price, $15. For Sale by

AMERICAN GAS LIGHT JOURNAL, 42 Pine St., New York City.

JAMES D. PERKINS, President. F. SEAVERNS, Treasurer.

THE PERKINS COMPANY,

228 and 229 Produce Exchange, New York City.

**OCEAN MINE YOUGHIOGHENY GAS COAL,
OLD KENTUCKY SHALE AND O. K. BOGHEAD.**

BERWIND-WHITE COAL MINING COMPANY'S

Ocean Westmoreland Gas Coal.

Offices:
Washington Building, New York.
Betz Building, Philadelphia.

STRICTLY High Grade. . . . .
Carefully Prepared
For Gas Making or
Heavy Steaming. .

A. C. M. AZOY, General Agent, 1 Broadway, New York.

CHAMBER OVENS.

Do You Know About Chamber Ovens?

Horizontal, Vertical, or Inclined.

If your output is over 250,000 feet per diem don't fail to consult

THE CHAMBER OVEN CO.,

405 Keene St.,

MILWAUKEE, WIS.

FRED. BREDEL, President.

WM. H. CAMPBELL, Eastern Agent,

Virginia State Insurance Building, Richmond, Va.

Horizontal Chamber Oven with four chambers. Capacity, 125,000 cubic feet per oven.

PETER YOUNG, President.
Works,
LOCKPORT STATION, PA.

ESTABLISHED 1864.

JAMES GARDNER, JR., CO.,

Successor to WILLIAM GARDNER & SON.

N. A. YOUNG, Secretary and Treasurer.
Address all communications to
JAMES GARDNER, JR., CO., Bolivar, Pa.

Fire Clay Goods for Gas Works.

KELLER ADJUSTABLE COKE CRUSHER.

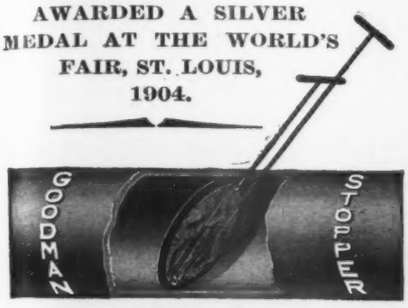
Strong, Simple, Durable. Will Crush any Size Desired.

C. M. KELLER.

Columbus, Ind.

Correspondence Solicited.

AWARDED A SILVER MEDAL AT THE WORLD'S FAIR, ST. LOUIS, 1904.



AGENTS.

Pacific Coast—VAN E. BRITTON, 269 Monadnock Building, San Francisco, Cal.

Great Britain—PARKER & LESTER, Old Kent Road, London.

MANUFACTURED BY

SAFETY GAS MAIN STOPPER CO.,

257-263 East 133d Street,

NEW YORK CITY.

PATENTS, TRADE MARKS, COPYRIGHTS.

ROYAL E. BURNHAM,

Solicitor of Patents and Counsellor in Patent Causes.

833 Bond Building, Washington, D. C.

Send for Pamphlet on Patents.

EDMUND H. McCULLOUGH, President. H. C. ADAMS, 1st Vice President. CHAS. F. GODSHALL, 2d Vice-Pres. & Treas. HENRY WHARTON, Secretary. C. B. NICHOLS, Assistant Secretary.

THE WESTMORELAND COAL CO.

Chartered 1854.

Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Pa.

POINTS OF SHIPMENT:

PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J., WATKINS (SENECA LAKE), N. Y.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

Principal Office, 224 South 3d St., Phila., Pa.

GAS MAINS—SERVICE PIPES.

Their installation for High or Low Pressure is the work in which we have specialized for years. Because of our Facilities and Experience, many Gas Companies prefer to contract with us for such work, rather than to execute it themselves. It proves to be as cheap in the end. We solicit inquiries.

Telephone Connection.

SULLIVAN BROS.,
11 Main St., Flushing, N. Y.

JOHN CABOT, President. GEO. D. CABOT, Secretary.

1412-1428 Adams Street, Hoboken, N. J.

PURIFIER AND SCRUBBER TRAYS

Church's Patent Trays,

Reversible; Strongest; Most Easily Repaired.

We also Supply the Cheapest and Strongest

Reversible Bolted Trays.

Special Trays for Iron Oxide in Either Style

GAS TAPPING MACHINES

—FOR—

Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

Send for Circulars.

Geo. Light,
DAYTON, O.

AMERICAN GAS ENGINEERING PRACTICE,

A HANDBOOK FOR ALL ENGAGED IN THE INDUSTRY,

Comprising Many Details Not Heretofore Published,

By M. NISBET LATTA, C.E.,

PART I. WATER GAS MANUFACTURE. The Generator. The Carburetter. The Superheater. Wash Box and Tar. Scrubbers. Condensers. Purifiers. Exhausters. Station Meters. Holders. Details of Works' Operation.

" II. GAS DISTRIBUTION. Naphthaline. Mains. Services. Consumers' Meters. Pressure. House Piping. Appliances.

" III. GENERAL TECHNICAL DATA. Properties of Gases. Steam. Mathematical Tables. Conversion Factors. Pipe and Miscellaneous Data.

Price, $4.50. For Sale by

A. M. CALLENDER & CO., 42 PINE ST., NEW YORK CITY.

DAVIS & FARNUM MANUFACTURING CO.,

Waltham, Mass.

GAS HOLDERS

Steel Tanks for Naptha Storage, Machinery for Coal and Water Gas Plants.

H. M. BYLLESBY & COMPANY

(INCORPORATED).

GAS ENGINEERS,

DESIGN, CONSTRUCT AND OPERATE
COMPLETE COAL, WATER AND CRUDE OIL GAS PLANTS.

EXAMINATIONS AND REPORTS.

218 LA SALLE STREET, CHICAGO.

Oklahoma City, Okla. Mobile, Ala. San Diego, Cal.

ALEX. C. HUMPHREYS, President.
EMILE GUILLAUDEU, Treasurer.
ROBT. O. LUQUEER, Secretary.
HOWARD E. WHITE, General Counsel.

EUROPEAN CORRESPONDENTS.
HUMPHREYS & GLASGOW,
LONDON. — BRUSSELS.

HUMPHREYS & GLASGOW, INC.,

CONSULTING ENGINEERS.

ADVICE AS TO EXTENSION, MANAGEMENT AND RECONSTRUCTION OF GAS AND ELECTRIC PLANTS.

COMPLETE EXAMINATIONS MADE. ~ ~ ~ PROPERTIES PURCHASED.

CITY INVESTING BUILDING, 165 BROADWAY, NEW YORK.

"Hunt" Labor-Saving Machinery for Gas Works.

McDonald-Mann Quenching Chutes, Spokane Gas Light Co.

McDONALD-MANN QUENCHING CHUTES FOR COOLING COKE.

Where this system is in use, there is no injury to the chutes and steel work of the building, through corrosion due to the action of the gaseous vapors, unavoidable with the old method of cooling the coke on the floor.

Every Superintendent and Gas Engineer in charge of construction work should make themselves acquainted with this method. Start right away by sending for our Bulletin A-3.

Sole Manufacturing and Selling Agents,

C. W. HUNT COMPANY, { Established 1872.

General Offices and Works. . . . . { WEST NEW BRIGHTON, NEW YORK. NEW YORK OFFICE, 45 BROADWAY.

HENRY I. LEA,

CONSULTING GAS ENGINEER.

DESIGN---CONSTRUCTION---MANAGEMENT

OF

GAS PLANTS

FOR

CITY SUPPLY---
POWER DEVELOPMENT---
INDUSTRIAL HEATING.

EXAMINATIONS AND REPORTS.

ROOKERY BUILDING, CHICAGO.

FIELD'S ANALYSIS FOR THE YEAR 1908

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland; being the 40th year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by

AMERICAN GAS LIGHT JOURNAL, 42 Pine St., N. Y. City.

THE BARTLETT HAYWARD CO.
ENGINEERS & FOUNDERS.
BALTIMORE. NEW YORK.
COAL & WATER GAS PLANTS
GAS HOLDERS

DISCHARGING SIDE OF INCLINED RETORTS.

CABLE ADDRESS:
WILDOLPH, NEW YORK.

WILLIAM W. RANDOLPH, M.E.,
CONSULTING ENGINEER,
FORMERLY CHIEF ENGINEER AND VICE-PRESIDENT OF
HUMPHREYS & GLASGOW, INC.

165 BROADWAY
NEW YORK CITY.

EXAMINATION AND VALUATION OF PUBLIC UTILITY AND POWER CORPORATIONS.
ADVICE AS TO CONSTRUCTION AND MANAGEMENT.

WE STOP CLINKERS.

NEW CONVERTS

TO THE ECONOMIZER ARE BEING RECEIVED AND SATISFIED USERS ARE DUPLICATING THEIR ORDERS AS FAST AS RENEWALS ARE REQUIRED.

NEW BENCHES—REFILLINGS.
Horizontals—Inclines—Verticals.

THE IMPROVED EQUIPMENT COMPANY,

MAIN OFFICES: 60 WALL STREET, NEW YORK, N. Y.

Western Agents for the Dessau System of Vertical Retorts.

SOLE LICENSEES FOR THE DOHERTY BENCH FUEL ECONOMIZER.

FIELD'S ANALYSIS
For the Year 1908.

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 40th Year of Publication.

PRICE, $5.

For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine Street, New York City.

ESTABLISHED 1851.

THE STACEY MANUFACTURING COMPANY,

CINCINNATI,

Designers, Manufacturers and Builders of

Gas Holders,

Plate and Structural Work,

Tanks of Every Description,

All Ironwork and Apparatus Required in a Gas Plant.

THE "CHOLLAR" SYSTEM OF GAS PURIFICATION.

INQUIRIES SOLICITED.

KERR MURRAY MANUFACTURING COMPANY,

Engineers and Manufacturers

APPARATUS FOR COAL GAS PLANTS,

SINGLE AND DOUBLE-LIFT GASHOLDERS
AND STEEL TANKS,

Latest Improved

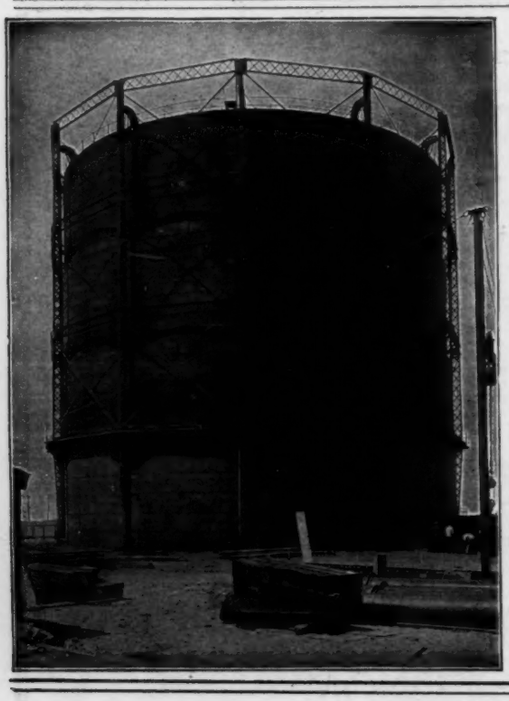
ROTARY EXHAUSTERS, P. & A. TAR EXTRACTORS, AMMONIA WASHERS,

CONDENSING, SCRUBBING AND PURIFYING APPARATUS.

Street Specials and Valves.

ADDRESS:

KERR MURRAY MANUFACTURING COMPANY, FORT WAYNE, IND.



JOHN FOWLER, President. J. SCOTT FOWLER, Vice-Pres. & Treas.

DEILY & FOWLER MFG. CO.,

39 Laurel Street, Philadelphia, Pa.

ESTABLISHED 1842. INCORPORATED 1908.

BUILDERS OF

GASHOLDERS,

Single-Lift or Telescopic,

With or Without Steel Tanks.

Oil Storage Tanks, Water Tanks, Etc.

ESTIMATES CHEERFULLY FURNISHED.

CORRESPONDENCE SOLICITED.

ASK ABOUT OUR

VICTOR BLOWERS,

For Use with Industrial Gas Appliances.

WE ALSO SOLICIT YOUR INQUIRIES FOR

GAS EXHAUSTERS,
HIGH PRESSURE GAS PUMPS,
BOOSTERS,
HUNTOON GOVERNORS,
PRESSURE REGULATORS,
BLAST VALVES,
ETC., ETC.

THE CONNERSVILLE BLOWER COMPANY,

Connersville Indiana, U. S. A.

NEW YORK OFFICE, 50 Church Street. CHICAGO OFFICE, 536 Monadnock Building.

AMERICAN GAS ENGINEERING PRACTICE,

By M. NISBET LATTA, C.E. PRICE, $4.50.

For Sale by

AMERICAN GAS LIGHT JOURNAL, - 42 Pine St., New York City.

D. McDONALD & CO.,

971-997 BROADWAY, ALBANY, N. Y.,

MANUFACTURERS OF

DRY GAS METERS, STATION METERS, PREPAYMENT METERS, METER PROVERS AND GAUGES.

THE GLOVER PREPAYMENT METER,

Simple, Strong, Satisfactory.

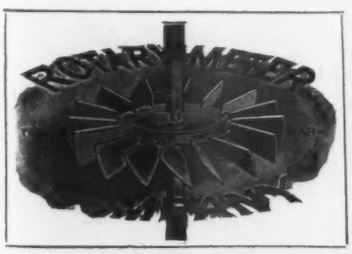
THE HINMAN STATION METER DRUM,

The greatest advance that has been made in 20 years in the ACCURATE and ECONOMICAL measurement of gas in large quantities. :: :: ::

NEW YORK OFFICE: 561 West 47th Street. | ALBANY OFFICE: 991 Broadway. | CHICAGO OFFICE: Jefferson and Monroe Streets.

We can meet your requirements for

STATION METERS



On all capacities from 1,500 to 500,000 cu. ft. per hour.

One-half the Cost—One-tenth the Space of Old Style Wet Meters.

When in Need of Station Meters Write

ROTARY METER COMPANY,

280 Broadway, NEW YORK.

Our Literature and all information will be sent on request.

The Sprague Meter Co.

Manufacturers of

Cast Iron Gas Meters

for

Artificial or Natural Gas

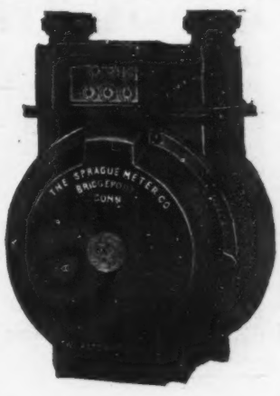
Plain or Prepayment

Lower in first cost and cheaper to maintain than any meter on the market.

Write us for particulars.

The Sprague Meter Company

203 Water St., Bridgeport, Conn.



R. D. WOOD & CO.,

400 CHESTNUT ST., PHILADELPHIA,

MANUFACTURERS OF

Cast Iron Pipe.

HEAVY LOAM CASTINGS,

Dunham Specials,

Hydraulic Work,

LAMP POSTS, VALVES, ETC.,

Gas Power Plants with Producers.

BUILDERS OF

Gasholders.

Single or Multiple Lifts, with or without Metal Tanks.

PURIFIERS, CONDENSERS, SCRUBBERS, BENCH WORK.

Cutler's Patent Freezing Preventer for Holder Cups.

NATHANIEL TUFTS METER COMPANY,

455 Commercial St., Boston, Mass.

PREPAYMENT GAS METERS,

WET AND DRY GAS METERS, STATION METERS, ETC.

REPAIRING OF ALL MAKES OF METERS, AND FITTED WITH OUR PREPAYMENT ATTACHMENT.

B

METERS.

INCREASED CAPACITY.

INCREASED EFFICIENCY.

PREPAYMENT METERS, STATION METERS, METER PROVERS, ETC.

PROMPT AND CAREFUL ATTENTION TO ALL REPAIR WORK.

MARYLAND METER COMPANY,

BALTIMORE.—CHICAGO.

YOU NEED ONE OR MORE OF OUR COMPLAINT METERS.

METERS, Plain and Prepayment,

For Artificial or Natural Gas.

Repairing All Makes and Attachments Added if Desired.

SPECIAL METERS FOR ACETYLENE.

KEYSTONE METER COMPANY,

ROYERSFORD, PA.

AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Wet and Dry Gas Meters, Station Meters, Meter Provers, Photometrical Apparatus, Gauges,

PREPAYMENT METERS,

REGULAR METERS REFITTED WITH PREPAYMENT ATTACHMENTS.

HELME & McILHENNY,

Established 1848. **1339 to 1349 Cherry Street, Philadelphia, Pa.**

MANUFACTURERS OF

Wet and Dry Gas Meters, Station Meters, Provers, Gauges, Etc.

METERS REPAIRED

PREPAYMENT GAS METERS.

Our Own Patents. Strong. Simple. PROMPT ATTENTION. CORRESPONDENCE SOLICITED.

METRIC METAL COMPANY,

MAKERS OF

GAS METERS for NATURAL and ARTIFICIAL GAS.

Special Attention given to Repairing METERS of all Makes.

FACTORY AT ERIE, PA.

THE FULTON GAS PRESSURE GOVERNORS

For Artificial or Natural Gas.
For District or Individual Service.

Our Improved **Duplex Sensitive Governor** for district service will reduce high pressure gas to inches of water without variation. Absolutely safe and reliable. No complicated mechanism to get out of order. No auxiliary regulators or other devices to assist the main governor required. The most simple and perfect governor ever placed on the market. We also manufacture Holder Governors, Compressor Governors and Individual Service Governors for any inlet and outlet pressure.

More than 20 years' experience with the largest gas companies. Send for Catalog.

THE CHAPLIN-FULTON MFG. CO.,

VAN E. BRITTON, Pacific Coast Agent, Monadnock Bldg., San Francisco, Cal. 28-34 PENN AVE., PITTSBURGH, PA.

JOHN J. GRIFFIN & CO.,

1513 TO 1521 RACE STREET,
PHILADELPHIA.

559 West 47th Street,
NEW YORK.

Jefferson and Monroe Streets,
CHICAGO.

GAS METERS,

Station Meters and Apparatus of Every Description.

REPAIRING CAREFULLY DONE.

THE POSITIVE PREPAYMENT METER.

OVER 600,000 OF THESE PREPAYMENT METERS ARE IN USE IN THE UNITED STATES, AND THE DEMAND IS STEADILY INCREASING.

If you have some ordinary meters to be repaired, send them to us and let us repair and convert them into prepayment meters. They will be a source of satisfaction and profit to you.

SEND FOR OUR CATALOGUE AND OUR PREPAYMENT BOOKLET.